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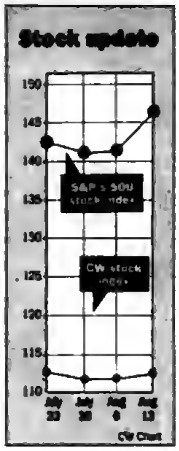
Stock update



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Executive Roundtable
MIS answers end users/**41**

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The merging of computer and telecom operations/**59**

TOP OF THE NEWS

Pledging major resources to help market Dbase Mac, Appie stands with Ashton-Tate. **Page 10.**

■

Attempting to address financial woes, Convergent Technologies axes 25% of its staff, cuts executive salaries. **Paga 108.**

■

Burroughs bridges workstations and resource processors to Disoss. **Paga 14.**

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Turbo versions of Apollo's engineering workstations debut. **Page 6.**

■

Floating Point Systems moves its minisupercomputers from the computer room to the office environment. **Page 37.**

■

Ashton-Tate's Aug. 19 corporate pricing announcement is scheduled to include charges for a technical support hot line, technical newsletters and provisions for the removal of copy protection for large customers. Unlike Lotus's recently announced plan, Ashton-Tate will not sell direct to corporations. The firm will not offer site licensing. All existing prodocts, including Dbase Mac, will be immediately covered by the plan, sources said.

■

Adding more confusion to IBM's mid-ranga strategy, an IBM observer claims officials in IBM's Marketing Assistance Program reyealed that the IBM 4300 family — small mainframes and minicomputers that have been key elements of

See **NEWS** page 7

Coming this week:

FOCUS

Unix operating system trends and issues will be targeted in *Computerworld Focus*, due out Aug. 20. *Focus* will analyze the Unix marketplace, explore leading product implementations, probe the MS-DOS/Unix connection and talk to users who have taken the Unix plunge.

Military acts to speed OSI

DOD push for tools to cut costs spurs development

By Elisabeth Horwitt

A Department of Defense cost-cutting mandate for its divisions to buy off-the-shelf communications systems will spur rapid commercial availability of Open Systems Interconnect (OSI) connectivity tools, observers say.

The department is supporting private-sector development of commercial OSI products io order to save military organizations from having to duplicate that work internally using proprietary protocois. "We want to avoid reinventing the wheel," says Rhoda Mancher, associate director of information resource management for the Naval Operations Systems Division.

See **MILITARY** page 4

IBM recovery system delayed

By Charles Babcock

RYE BROOK, N.Y. — An important IBM recovery product for large-scale data base management systems has run ioto testing snags and may be as much as a year away from general availability.

IBM first acknowledged the delay in an unusual statement earlier this month in which it confirmed product difficulties and said general availability had been rescheduled, but it did not specify a release date. The product, called Extended Recovery Facility, was designed to provide an instantaneous backup to IBM's widely installed IMS data base management

See **IBM** page 12

Largest users win Lotus concessions

By Douglas Barney

CAMBRIDGE, Mass. — Major corporations received a long-awaited and much-demanded concession from Lotus Development Corp. last week, with the firm at least partially acceding to user demands for site licensing and volume purchase programs on its popular software.

Promising it will be Lotus's major announcement for 1986, company Chairman Jim Manzi said the plan "establishes a new kind of relationship between us and our customers." The program, however, drew a mixed reaction because it only provides direct sales and free high-level support to the very largest Lotus customers.

Called the Multi-Value Plan, the program offers a variety of purchasing and distribution options and provides a means for the elimination of copy protection (see story page 8). The bulk of the programs that make up MVP are currently available

One element, Lotus's Corporate Access, provides direct sales only to firms that order 500 or more packages that are sent to a single location These sales can be made through the Special Bids program, under which the firm negotiates a price with Lotus and receives the contracted number of packages, or through the Electronic Distribution program, under which users can download the software from their mainframe

"If you believe that MIS/DP is taking over more control, by nature MIS/DP likes to deal with vendors directly," said Stephen J. Crummey, vice-president of sales and service for Lotus. So far, 23 firms have signed up for the Special Bids program

Those customers seeking the removal of copy protection must have an officer of the company sign a written contract stating that the firm has a policy prohib-

See **LARGEST** page 8

CW INSIGHT

Gates talks: The 386 machines, a new MS-DOS and beyond

By Douglas Barney

Microsoft Corp. Chairman and MS-DOS crusader Bill Gates is not afraid to stick his neck out. He announced the development of a product called Windows when it was but a gleam in a programmer's eye and personal computers lacked the power to even run such a product effectively.

But Gates pressed on and is finally beginning to see his faith in Windows bear fruit. Three years after the origioal announcement, Lotus Development Corp. has promised to develop for Windows, and Ashton-Tate has given a cautious endorsement.

Now, Gates, who says he will not rest until he sees a microcomputer on every desktop, has shifted his attention to the development of a new version of MS-DOS. Due in 1987 at the latest, the upgrade will unlock the immense address space of the latest generation of micros based on Intel Corp.'s 80286 chip, as well as that of the still-to-come 80386 machines.

Chairman Gates

Gates sat down with *Computerworld* in Boston last week and spoke about the new MS-DOS, his microcomputer software competition, Microsoft's ties to key software developers and his tips for personal computer buyers.

CW: Should corporations buy 286-based machines today, or wait until 386 machines are available later in the year?

GATES: First, we've been encouraging people not to buy 8088-based machines. They're going to run out of gas on a performance basis alone, not to mention the memory address space problem. I think the 286 machines have the performance, and with the right version of DOS, they have the 16M bytes, so people should feel pretty good about having a 286

CW: And the 386?

GATES: It's even better. When these machines finally come out, users will have

See **GATES** page 6

Sluggish NCC forces AFIPS layoffs, donation cutbacks

By David A. Ludlum

RESTON, Va. — Stung by disappointing attendance at its National Computer Conference this year, the American Federation of Information Processing Societies (AFIPS) is laying off approximately one-half its headquarters staff. The cutbacks will leave AFIPS with a staff of 25, down from approximately 50 earlier this year, federation President Jack Moshman said last week.

AFIPS is also halting its charitable donations to such institutions as the Boston Computer Museum; *Computer Chronicles*, a public televison program; and the Charles Babbage Institute, a computer archive at the University of Minnesota.

AFIPS is a nonprofit federation of 11 computer users organizations, including the Data Processing Management Association, Association for Computing Machinery and the Computer Society of the Institute of Electrical and Electronic Engineers.

While unexpectedly slack attendance at the 1986 NCC, held in Las Vegas in June, has presented AFIPS with a budget crisis, the group is not cutting back on support staff for NCC or for its NCC Telecommunications Conference, to be held in Philadelphia next month, Moshman said.

"NCC absolutely is not going to be reduced in importance. We look for telecommunications to be an important and growing part" of AFIPS' activities, he said.

AFIPS has reduced its conference support staff slightly because of the federation's abandonment earlier this year of the annual Office Automation Conference, the other major gathering AFIPS had sponsored, Moshman said.

The federation also will not cut back staff for its publishing division, which issues proceedings of conferences, monographs and computer-related subjects; its Washington, D.C., office, which provides information on trends in technology for legislators and other government officials; or support for the International Federation of Information Processing Societies, according to Moshman.

AFIPS had donated roughly $100,000 a year to *Computer Chronicles* and provided "fairly sizable [advisory] staff backup" for the show, Moshman said.

AFIPS budgets operations on the basis of projected attendance at its major conferences, which generate most of the income and tend to come late in its fiscal year, Moshman said.

"We were frankly surprised this year at the reduction. We don't have all the numbers yet. From head counts and so on, we know it is less than we thought it would be," Moshman said of attendance during the current fiscal year.

He declined to provide estimates of federation revenue or the decline this year from 1985. He said the drop-off was "enough to make us sit up and take notice."

The layoffs and cutbacks stem from the federation's conservative estimate of its revenue for the upcoming fiscal year, which begins Oct. 1, Moshman said.

WIDE WORLD PHOTO

End of an era

The U.S. Navy lifted its cap to Rear Adm. Grace M. Hopper last week when the 79-year-old codeveloper of Cobol retired in ceremonies aboard the 189-year-old USS Constitution in Boston. Hopper, who had been retained on active duty since reaching official retirement age, was presented the Distinguished Service Medal by Navy Secretary John F. Lehman Jr.

In this issue

ILLUSTRATIONS ON PAGES ONE AND 17 BY ALAN WITSCHONKE

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Military acts to speed OSI

From page 1

Historically, the DOD has used Transmission Control Protocol/Internet Protocol (TCP/IP), a set of communications protocols developed specifically for military networks. A 1985 report jointly produced by the DOD and the National Bureau of Standards (NBS) estimated that buying off-the-shelf OSI products would be between 30% and 80% less expensive for the military than if it developed its own equivalent TCP/IP products.

The military also favors standards such as OSI and integrated Services Digital Network (ISDN), because these would provide a common interface between Defense Data Network sites in the U.S. and overseas. The two standards are gaining support from a growing number of foreign businesses as well as international bodies, such as the North American Treaty Organization, which has announced support for OSI.

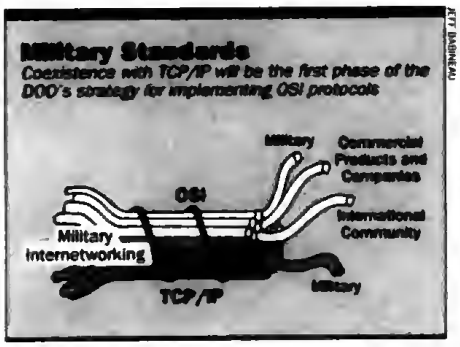
According to Mancher, various divisions of the armed forces only recently began looking for a viable internetworking standard, because they are beginning to hook up their own largely autonomous communications systems to the Defense Data Network. "We don't want a strategy that will be out of date by the time we implement it. Frankly, we need an effective way to link ISDN before we're really ready to fight World War III," she says.

"Everyone wants to see the DOD convert to OSI," says John Haefner, chief of the NBS's systems and network architecture division. "But in order for them to maintain operations during the five to seven-year conversion period, they need gateways between the new OSI systems and their current systems that use TCP/IP."

Hence, military-funded development of OSI gateways will also be of use to private-sector users who have been using TCP/IP. This standard, the military's current de facto standard, is also the closest thing to a multivendor networking system that is currently available.

While it has not yet committed to phasing out TCP/IP completely, the DOD has decided to use the OSI standards, currently being developed by the International Standards Organization (ISO), "whenever international standards are available and can be used to support military requirements," Assistant Secretary of Defense Donald Latham said in an official statement more than a year ago.

Latham's directive reflects the U.S. military's realization that OSI, not TCP/IP, will become the international communications standard. The recent surge of TCP/IP product introductions "is a trickle compared with what computer vendors are doing behind the scenes with OSI," according to Haefner. "The new TCP/IP products are primarily bids from smaller companies for a niche in the DOD market. In contrast, vendors are implementing OSI across the board.



JEFF BABINEAU

Even the DOD hasn't got a big enough stick to get that kind of support for TCP/IP."

Haefner predicted that, while it may take 20 years for OSI to reach the same kind of functionality as proprietary network systems like Digital Equipment Corp.'s Decnet and IBM's Systems Network Architecture, "enough of OSI will be in place for useful products to become available by next year."

The DOD's participation will certainly accelerate this trend, Haefner claims. The fruits of recently initiated projects, jointly funded by computer vendors, the NBS and various military organizations, "will certainly be made available to commercial users," he says. The following efforts are among those currently under way.

The Defense Communications Agency, the NBS, IBM and other vendors who are part of the OSInet project [CW, Aug. 11] are jointly funding the developing application-level gateways between OSI and TCP/IP as well as systems to test the gateways' performance. The tests will be run on OSInet, a prototype network currently being created by an alliance of 25 vendor and user organizations.

One gateway, which DEC reportedly is working on, will link the DOD's electronic mail protocol, Simple Message Transfer Protocol, with the equivalent OSI protocol, X.400. Similar projects will produce gateways between the military's File Transfer Protocol and OSI's File Transfer Access Method and between the military's Telnet and OSI's Virtual Terminal Protocol. These bridges should be available within the next 18 months, a DOD spokesman said.

The Naval Data Automation Command is working with the NBS on a performance testing system for OSI directory services protocols, which still have to be agreed on by the CCITT and ISO and finalized at an NBS implementation workshop. The directory services, which translate names to addresses for routing purposes, are "extremely important for organizations like the U.S. Navy who have to link up local networks to networks overseas," Mancher says.

The U.S. Air Force is working with the NBS to come up with OSI network management specifications, "which are currently not very far along or right, we feel," NBS's Haefner says. "Rather than wave our arms, we are looking at how network management is performed by existing systems such as IBM's Systems Network Architecture and the Defense Data Network."

Defining specifications

Finally, the DOD is in the process of defining Military Specification Supplements that define which options and subsets of OSI protocols are best suited to its needs.

"The ISO protocols can be characterized as having many optional features and user requirements," says Martin A. Thompson, associate director for the DCA interoperability and Standards Office. "It must be emphasized that the objective is not to create DOD-unique versions of commercial protocols, but to define an options set."

The Defense Data Network already conforms to the bottom three OSI layers, but it is only recently that the upper layers have solidified enough for the DOD to begin evaluating their potential in military internetworking. As recently as last year, the DOD's Latham noted that Transport Protocol-4 — the furthest along of the upper four layers of the OSI model — was then unavailable "as a proven commercial offering."

Military communications organizations such as the DCA and the Naval Data Automation Command — both of which became charter members of OSInet earlier this month — have since taken an expanding role in monitoring and accelerating the industry's progress toward viable commercial OSI products. Users should begin to feel the effect of this participation before too long.

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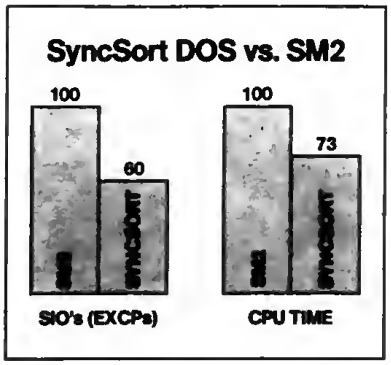

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Apollo, DEC bolster lines in hot engineering terminal mart

DG joins fray with software packages

By Rosemary Hamilton

CHELMSFORD, Mass. — Apollo Computer, Inc. last week rolled out two workstations that are based on and slated to replace the mid-range and high-end models the company introduced earlier this year.

Also last week, Digital Equipment Corp. cut prices and added enhancements to its workstation line.

In a further development last week in the hotly competitive engineering workstation market, Data General Corp., which has not been a significant factor in the engineering workstation market, jumped further into the fray by announcing two engineering software packages.

The Apollo DN570 Turbo and DN580 Turbo use a redesigned CPU and include expanded main memory and disk storage. Apollo will likely discontinue the current DN570 and DN580 models next year, according to Edward Zander, vice-president of marketing, although a final decision has not been made.

The DN570, designed for two-dimensional applications, and the DN580, designed for three-dimensional, graphics-intensive applications, were replacements themselves for earlier Apollo models.

For current DN570 and DN580 customers, a Turbo Performance Package is available to upgrade to either Turbo model.

The DN570 Turbo has a base price of $43,900, and the DN580 Turbo's price starts at $57,900. Pricing for the upgrade package starts at $12,500. Both Turbo models will be shipping in November.

Apollo said the new CPU, based on a Motorola, Inc. 68020 microprocessor, and other system enhancements have boosted the Turbo models' graphics performance by 30% to 50% over the current performance of the DN570 and DN580 models.

The Turbos feature a new, no-wait-state CPU with a 16K-byte physical cache memory and a 32-bit system bus, instead of the 16-bit bus used with the current models.

Integrating the CPU with the cache memory allows programs to access instructions in a no-wait state, while the new bus provides for faster communications between the CPU and other system devices, according to Helen Fuller, high-end workstations prodoct marketing manager at Apollo.

Memory capacity

The new systems will be offered with a minimum of 8M bytes of main memory, expandable to 16M bytes, while the DN570 and DN580 systems have a minimum configuration of 2M bytes. Disk capacity has been expanded to 2G bytes from 308M bytes.

Last week, DEC revamped three workstation models by boosting their minimum memory configurations from 3M bytes to 5M bytes and cutting prices on two of the models.

The company also added a $995 graphics tablet for the GPX series that allows users to input freehand sketches. The new GPX systems and tablet are currently available, the vendor said.

Both color and gray-scale versions of the four-plane models were also reduced in price by nearly $10,000. The color eight-plane model will continue to sell for $39,950.

Data General's two packages, TEO/Electronics and TEO/3D, were designed for DG's DS7500 engineering workstations, although they can also run on the vendor's full line of superminicomputers. The packages are part of the vendor's Technical Electronic Office (TEO) product line, which is modeled after its Comprehensive Electronic Office (CEO) software.

TEO/Electronics was designed for computer-aided engineering (CAE) applications and is made up of four separate components that will be sold separately and will range in price from $1,500 to $15,000. TEO/3D, which ranges in price from $25,000 to $170,000, depending on the number of users, was designed for three-dimensional modeling applications.

Gates talks: 386 machines

From page 1

to look at the price differential to decide whether the 286 or 386 makes sense. The 386 has more capabilities, so if the premium is small, I would go for the 386.

CW: What will extra address space give the user?
GATES: They can use applications that let them look up any document they might have written in the past three or four years, try to find patterns in their office procedures and suggest common procedures, execute SQL on the fly or run multiple applications at the same time — any type of scientific application or artifical intelligence. Even the new operating system will eat a lot of memory.

CW: How has the PC changed?
GATES: In the last couple of years, it has been recognized that dedicated word processors are a thing of the past and that general-purpose machines are now the choice for everything from technical publishing, circuit layout, to all the office productivity-type needs. The IBM Personal Computer or compatible is the most general because there are a lot of those out there.

The range of software that sits on top of MS-DOS is far greater than that that sits on top of mainframes. The state of the art for applications is really on the PC.

The state of the art in user interfaces is there; the state of the art in high productivity language tools is there. We have reached the frontier where microcomputer software companies are the innovators.

CW: Yet, it still seems that software development is lagging behind the development of hardware.
GATES: In 1981, we convinced IBM that they should use a 16-bit micro even though they were tempted, in order to meet their schedule and get it done, to use an 8-bit micro. So starting in early 1982, people were moving up to 16-bit, and for a couple of years people were learning how to take advantage of that machine.

Then a year ago, people started to hit the memory barrier. There are things the memory barrier is preventing people from doing. There is this bank switching stuff, the so-called expanded memory specifications that lets them get beyond that a little bit, but it is not as nice as having a large address space.

There will be advances in the operating system to support those new modes in DOS specifically. In the near future, you will see 386 machines, and those support address space of 4G bytes, which is larger than the largest IBM mainframe address space.

In order for applications to do major things, you have to have improvements first at the hardware level and then at the systems software level. Because of the nature of the 286, that was very difficult to do. There won't be the same kind of lag time for the 80386. Applications will be able to get at an incredible amount of power and performance. The 80386 is more powerful than most of the minicomputers out there today.

CW: What can you tell us about your work with Intel Corp. on the 80486?
GATES: It is so far off that there is nothing concrete at this stage. We have some ideas about how to advance the state of the art in microprocessors based on using some of our compiler technology.

CW: Do the other large micro software companies have an advantage because Microsoft is more willing to share development information with them?
GATES: When we do a new product development, we have to protect ourselves; we just can't go out and publicly talk about the specs and things like that.

A lot of the people you want to work with early on are the ones whose feedback will help you to make the product better. Some of these large companies do have good R&D people. Lotus has [Ed] Belove, a very smart guy; Ashton-Tate has [Robert] Carr, who is also a very smart guy. It is true that we sometimes show things early to those guys to get their feedback. There is an economic benefit to us there.

CW: Some software developers have charged that when Microsoft says that writing for Windows is much like writing for DOS, and that's a way of coercing developers into writing for Windows.
GATES: The memory managemeot and multitasking approach used inside Windows is the same as is used in future versions of DOS. Working with Windows memory management prepares you for working with the new version of DOS.

It is not to say that the new version of DOS has all of Windows in it. It doesn't have an embedded graphical user interface.

Should we have made them different? It is the same code. There is no pressure on anyone to develop for either Windows or the new version of DOS. I hope people decide to do it.

CW: Do you expect any problems in running the next version of DOS on IBM Personal Computer AT compatibles?
GATES: If something is truly, truly compatible, put the disk in and you're going. Every new piece of software has the potential to reveal areas where compatibles aren't compatible, and DOS 286 is no different. It actually has high potential to reveal incompatibilities.

CW: Is there any way for a corporation with compatibles to know which ones will be compatible?
GATES: Not today. Does it make sense to have a 286 DOS that doesn't run on popular machines? To the degree that those machines are out there, and can be tested — hey, let's be compatible.

CW: What should IBM do to prevent losing more market share to the clones?
GATES: IBM's best bet is to advance the state of the art aggressivley. Some of the elements with which they advance the state of the art, whether it be custom chips or special communications software, should be things that can't be easliy duplicated.

CW: What challenges does Apple face over the next year in establishing the Macintosh as a "second standard"?
GATES: They have to deliver on connectivity. It is technically possible to connect these wires together, but there are some software pieces that are missing. They have got to evolve the product line.

If a company wants to run some application that only exists on DOS, you have to make it possible for those five people to run their application. I think Apple can solve that. But if you have a bundred people who want DOS machines, there will never be a reason to call Apple.

CW: Will MS-DOS ever become multiuser?
GATES: We think DOS is much better for doing networking and multitasking, particularly when you look at things like graphics user interface. Having everybody on a shared processor can lead to unpredictable performance; that also doesn't lead to good expandability, and it is not going to save you that much.

CW: What do you have to do to keep maintain the dominance of DOS?
GATES: We have to be as good as minicomputer operating systems have been, and we have to be upwardly compatible.

CW: Do you see any competition coming in that area?
GATES: How could you get developers interested in doing software for something that wasn't compatible with DOS?

Users say workstation war small factor in purchase decisions

Budget cycles overrule vendors' repositioning

By Rosemary Hamilton

Engineering workstation vendors last week were embroiled in the second round of product repositioning of the year, but the frenzy appeared not to make the intended impact on the market. Users contacted by *Computerworld* claimed they have adjusted to the competitive atmosphere and will make purchase decisions based not on vendor claims, but on internal business concerns.

In a 24-hour span last week, Apollo Computer, Inc. introduced enhanced mid-range and high-end systems, Digital Equipment Corp. cut prices by nearly $10,000 on two Vaxstation II/GPXs and added enhancements to its workstation line and Data General Corp. rolled out engineering software for its workstation offerings (see story page 6). The announcements came one week after a major product debut from Sun Microsystems, Inc.

"We're getting used to this activity," said Thomas Heim, manager of the engineering computation center at the Space and Technology Group of TRW, Inc. "Our purchasing goes according to the corporate capital cycle more than anything else. We get the best bang for the buck at the time the money is allocated."

Like Heim, other users interviewed said the leapfrogging in workstation price and performance is not a major concern in purchasing decisions. Instead, users cited corporate budgets, vendor loyalities and the ability to match available systems to particular needs as the major factors in making purchases.

"Up front, I'll tell you I'm a big fan of Sun Microsystems," said Robert Judd, group leader of the computer graphics group at the Los Alamos National Laboratories, a research center in Los Alamos, N.M. "I think it's more important to buy into a vendor's philosophy rather than a particular item that's the rage this week."

Standard to put in a change order

TRW's Heim said it has become standard procedure at his firm to "put in a purchase order and then expect to put in a change notice." That way, he said, "we end up taking delivery of the latest product."

At AT&T's Bell Laboratories' facility in Murray Hill, N.J., Mark Plotnick, a member of the technical support staff, said the vendor activity makes it "kind of challenging to order something.

"We get a workstation at the exact time when somebody needs it," Plotnick said. "We can't delay these decisions arbitrarily. Sure, almost by the time it's arrived there will be something that's a better value. But that's the nature of this market right now," he said.

"It's the same old story in the workstation market as in any other industry," summed up Richard Shaffer, editor and publisher of "The Computer Letter." "If you can cost-justify a machine now, you go ahead and purchase it. Actually, I think the users are getting a heil of a deal because the prices on the hardware keep coming down."

TOP OF THE NEWS

NEWS from page 1

IBM's DP market strategy since 1979 — soon may be targeted strictly at the scientific and engineering markets and restricted from the commercial data processing market.

The source reported that customers of the 4300 will be steered toward the IBM System/38 product line. But other industry analysts said they had not heard the reports and doubted that IBM would take an affirmative action to pull the 4300s out of a specific market.

However, those same analysts conceded that concentrating 4361 and 4381 sales efforts in the scientific and engineering markets is part of IBM's current strategy.

■

Troubled Daisy Systems Corp. reported a major management shake-up late last week. Daisy's cofounder, President and CEO Aryeh Finegold and Chairman Frederick Adler resigned from the slumping Mountain View, Calif., engineering workstation firm.

Board member Max Palevsky took over the positions of chairman and CEO, and Executive Vice-President Harvey Jones was named president and chief operating officer.

Jones, 33, cofounded Daisy with Finegold and David Stamm, who rejoined the company as executive vice-president after recently resigning from that post.

■

AT&T Information Systems will market Oracle Corp.'s IBM SQL-based relational data base management system on its personal computer line in the last quarter of the year.

The DBMS will run on the AT&T 6300, 6300 Plus and Unix PC. No pricing has been set yet, AT&T spokesmen said.

Largest users win Lotus concessions

From page 1

iting software piracy and that the prohibition is enforced. In addition, the firm must have the latest releases, Lotus 1-2-3 Release 2 or Symphony 1.1. If these conditions are met, Lotus will send the firm a utility that will remove software protection from existing disks. The utility will not be available for Lotus 1-2-3 Release 1A.

Smaller firms can have copy protection removed through the Extended Value Program. Those firms must have at least 100 users upgraded to the latest versions of Lotus software, and company officials must sign antipiracy contracts similar to those of Corporate Access customers.

Larger customers tended to applaud Lotus's efforts to remove copy protection and sell direct. Others complained about the large volumes required to get direct sales, the high cost of support for smaller firms and the remaining limitations on the removal of copy protection.

User reaction

Despite the stringent requirements, some users were pleased with the removal of copy protection. "I am very much in favor of Lotus's approach to copy protection. If a company is not committed to not pirating, they shouldn't get unprotected software," said Alan Gross, chairman of the Microcomputer Managers Association in New York.

Many, however, were displeased by requirements of the antipiracy program. "It is extreme. The requirement of having the latest version is a financial burden. They are locking people into upgrades," said Steve Roth, manager of decision support systems for Manufacturers Hanover Leasing Corp. in New York.

The plans for the removal of copy protection are aimed at getting more corporations to upgrade to the latest version of Lotus products, Crummey admitted.

Like Special Bids, electronic distribution of 1-2-3 from a mainframe is available only to large Lotus customers.

"Today electronic distribution is for 1-2-3, but the intention is to have all Lotus products available on the mainframe," Crummey said. Electronic distribution is available for systems running IBM's VM. Distribution on an IBM MVS-based system is currentiy in development. Lotus will deliver a tape with the software to be loaded onto the mainframe and will use a similar approach for product upgrades and maintenance releases.

Up to 50 firms interested

"Ten to 15, to 20, growing to 50 firms have expressed interest in it. Those are the ones that are wired and connected," Manzi said.

Some users were concerned with the large purchases required to qualify for Special Bids and electronic distribution.

"My objections to the way they handle these situations is that they tend to eliminate whole areas of their user base when they make these kinds of announcements," said a micro manager who asked not to be identified.

Others were less critical. "It may be too high, but keep in mind that this a beginning, an initial stab. There is nothing restricting them from lowering that level," said Ted Klein, president of the Boston Systems Group, Inc., a management consulting firm familiar with the program. Other sources indicated that Lotus will lower the 500-unit requirement for direct sales and free support.

Small firms pay for support

Debate also centered around Lotus's charging smaller firms for support. Under the Lotus Prompt program, smaller customers pay $150 per year per user for the same level of support that Corporate Access customers receive free.

"I don't like that at all. We have a staff here that is already familiar with Lotus, and we already provide the support," said Bob Duste, information center section manager at Charles Schwab & Co.

"It is more than a little bit steep. You have got vendors out there like Corporate Software, Inc. that give you support free. We have a corporate expert who knows Lotus products intimately. He is available at a much lower cost to our users," Manufacturers Hanover's Roth said.

■

Quantity buyers get perks

Summary of Multi-Value Plan components and Lotus Development Corp. announcements:

- Corporate Access involves firms eligible for direct sales through special bids or electronic distribution.

These customers order 500 or more Lotus packages per year and are assigned a dedicated account team, sales representative, systems engineer, training contact and product specialist. Support, provided for free, includes a toll-free telephone hot line (in which the number of contacts is based upon the size of the organization and the account), free invitations to Lotus-sponsored seminars and conferences, executive briefings, product prerelease programs, "Update" (a quarterly newsletter) and a technical handbook updated semiannually. The corporations themselves are also eligible for limited liability contracts. Updates are sold direct.

- Special Bids involves the placing of volume orders direct to Lotus, and it requires a minimum of 500 units to be shipped to a single location. The corporation is responsible for distributing the packages to users.

- Electronic Distribution requires an IBM 370 mainframe or compatible and personal computers with IBM 3270 emulation. It is available for firms purchasing 500 or more units, and the corporation is responsible for downloading and distributing documentation.

- Lotus Prompt, a $150 support program that provides special toll-free phone support (eight calls per contract to senior technical staff, quicker response), a quarterly newsletter, 50% discount on any two different Lotus companion products and maintenance and upgrade packages.

Smaller firms essentially pay for the same level of support that larger customers receive free.

- Extended Value Program is available to approximately 400 firms that have upgraded at least 100 users to the latest version of 1-2-3 or Symphony. It provides discounts on Lotus companion products and the ability to remove copy protection from those upgraded units. Lotus declined to disclose the program's price.

- Lotus Direct is a business unit that provides direct sales to any size corporation of Lotus companion products. All sales are at full retail price.

- Lotus will form a Lotus Corporate Council based upon 12 major customers to meet twice annually to discuss "business issues."

- Unprotected versions of 1-2-3 will be made available to U.S. government agencies. Lotus has been locked out of many government bids based on the copy protection. Availability is scheduled for Nov. 15, the company said.

- Lotus announced five authorized training centers to provide "high-quality training."

- Lotus created the Application Services group to assist corporate customers in developing specialized applications.

Initially available in New York and Boston, the service will spread to most other major cities by mid-1987.

Later this year, Lotus will announce another companion product designed to speed the use of its spreadsheet software, according to Michael E. Kolowich, corporate vice-president of marketing and business development for the company.

Networker puts 1-2-3, Symphony on file server

Lotus Development Corp. last week also announced the Networker, a package that will allow 1-2-3 and Symphony to be installed on a file server and accessed by users on personal computers tied in via a local-area network.

The software can then be loaded onto PCs without a key disk. Via the Networker's Network File Access Program, networked users can retrieve shared work sheet files and lock other users out from the file while it is in use.

The product works only with the most current versions of 1-2-3 and Symphony but will not be available until the first quarter of next year. Customers will be billed on the number of packages used.

"We are talking about server-based management of the software. The idea is to have a network authorization package sitting on the server, which has a counter which counts the number of software packages installed on the server and counts against that the number of simultaneous users who are using the software at any given time," said Michael E. Kolowich, corporate vice-president of marketing and business development for Lotus. "A true networking product will have to wait for the maturatioo of the networking operating systems and other operating systems in order to truly provide a good group productivity solution in the spreadsheet world."

HP software uses idle MIPS, pushes OA functions to micros

By Charles Babcock

PALO ALTO, Calif. — Hewlett-Packard Co. last week said it is offering added functionality on its Personal Productivity Center minicomputer package and pushing function down to the level of personal computers.

As one of the top three office automation companies in the U.S., according to Framingham, Mass.-based International Data Corp., HP is directing its strategy toward making use of the idle million instructions per second on micros, according to Pete Shepherd, product manager of HP's Office Productivity Division in Wokingham, England.

HP is introducing Advancemail, a $395 electronic mail service that resides on an IBM Personal Computer or HP compatible and connects to the HP Deskmanager, an existing application manager resident on the HP 3000 minicomputer.

In addition, HP announced Version B of Deskmanager for $4,800 to $12,000; HP File/Library, an optional package for community filing and archiving for $2,800 to $7,000; and HP Schedule, an option for scheduling meetings and use of resources for $1,200 to $3,000, the company said.

With Advancemail, users can compose messages, including files, on personal computers and transfer them to the Deskmanager for distribution. Advancemail can direct messages to be stored on the HP 3000 until called for.

Because the miero, rather than the minicomputer, processes these functions, the number of users who can be supported by one HP Personal Productivity Center is doubled, Shepherd said.

Once messages are sent to the Deskmanager, the mini-based software can forward them to other Deskmanager units or IBM's Professional Office System and Distributed Office Support System office automation systems, he said.

Version B of the Deskmanager includes enhancements to electronic mail, word processing, electronic filing and time management functions.

6 REASONS WHY

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SOFTWARE ENGINEERING OF AMERICA SEA

Dbase Mac aids Apple attempt to create alternate standard

Marketing drive may desert other vendors

By Maura McEnaney

PALO ALTO, Calif. — Ashton-Tate last week announced its expected data base management package for the Apple Computer, Inc. Macintosh, adding its endorsement to Apple's plans to create an alternate standard to IBM.

The package, Dbase Mac, is a relational data base management system that uses the Macintosh interface to allow users to set up their own data relationships without programming. The product is priced at $495 and is scheduled for release in the fourth quarter. The initial release is a single-user product, but Ashton-Tate said a multiuser version for network use will follow.

Apple Chief Executive Officer John Sculley joined Ashton-Tate CEO Ed Esber in announcing the product, which was exhibited last week at the Macworld Expo in Boston.

"We made sure you could do on the Macintosh version anything you could do on the IBM versions," said Michael Stone, director of new product marketing. Stone stressed that Dbase Mac is not a part of the Microsoft Corp. MS-DOS Dbase III package. The Macintosh product "significantly reduces the amount of programming" required by users, he said.

"In Dbase for the Mac, you can see a lot of features that will be in future generations of our IBM products," particularly through the more advanced user interfaces and use of graphics, Stone said.

Sculley's presence at the introduction raised some questions as to whether Apple will throw its marketing weight behind Ashton-Tate and abandon support for early Macintosh DBMS products such as Blythe Software, Inc.'s Omnis III Plus and Double Helix from Odesta Corp.

Macworld Expo coverage on page 12

At last Monday's announcement in Apple's backyard of Palo Alto, Calif., Sculley said Apple will put major marketing resources into marketing Dbase Mac, although he would not elaborate on the agreement.

Ashton-Tate's entry into the Apple DBMS market may be too late to woo customers who already use other Macintosh DBMS products. For the past six months, Macintosh users at Seafirst Corp. in Seattle have been working with Blythe's Omnis III. Seafirst has not looked at the Dbase Mac product because of its success with Omnis, according to Assistant Vice-President Jim Kuhr.

Omnis, he said, "is a pretty easy-to-use product. It's fully relational and fully programmable in terms of the way you can set up relations between different files in a data set." Although Seafirst uses some of Ashton-Tate's Dbase products, he added, "I don't feel there is a compelling reason to drive us into the Dmac environment."

While several Macintosh users contacted before the product announcement were not sold on the idea of Dbase for the Macintosh [CW, Aug. 11], analysts present at the product announcemeht handed in positive reviews.

Infocorp's Bob Lefkowits said he was impressed with the product because of the way users can actually see the relationships they are setting up between data structures. "You can't visuallze it as easily in other products," he said. "I think this product will do all right."

Dbase Mac allows users to link up to 36 data files through common fields. The relationships are established by using the mouse to carry a key field from one file to another. An arrow appears on the screen to illustrate the data relationship.

The product also lets users customize reports by selecting type styles and fonts. The product supports Apple's Imagewriter printer, Laserwriter and Laserwriter Plus.

Dbase Mac has the capability to let users access IBM-compatible Dbase data files and can transfer files via the standard ASCII test. The product will run on a Macintosh with 512K bytes of random-access memory or on a Macintosh Plus with a System 3.1 operating system and a minimum of two disk drives, one of which must be the recent 800K-byte capacity drive. It can also be installed on hard disks.

Ashton-Tate's introduction has refocused the discussion as to whether the Macintosh can be a viable product in the business market. "We saw the Macintosh becoming a standard for its user interface," Esber said."The fact is the Macintosh is a success as a business tool." Esber said he expects the product's procedural language to encourage new applications from third-party developers.

Stone conceded that few corporations have standardized on the Macintosh, but he noted the machines are increasingly penetrating that market. "The Macintosh is legitimizing the side door," Stone said. Consequently, more Macintosh products are to follow, and he added, "We're definitely up to our eyes in Mac development."

But according to Infocorp's Lefkowits, the real success of Ashton-Tate's product will depend on the future plans for the Macintosh. "The key is what the announcements for the Mac will be over the next six months. If the Mac were going to stay where it is now for the next six months, I don't think Ashton-Tate would have announced anything," Lefkowits said.

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IBM recovery system delayed

From page 1

systems. Observers predicted it may be as much as a year before the package becomes generally available.

In the announcement, IBM stated that it has been forced to stretch its "early support program," an IBM euphemism for beta-site testing, of Extended Recovery Facility. Originally announced in February 1985 in conjunction with the Sierra 3090 mainframe, XRF was due for release to IMS users by the third quarter of 1986.

IBM is now saying "the high availability provided by XRF requires extraordinary levels of quality, thereby necessitating continued refinement of the product." The Aug. 5 announcement was a terse, four-paragraph statement that supplied no estimate of when XRF will be available, saying only that more information will be released in the first quarter of 1987.

'A tough bite to chew'

Developing XRF "is a tough bite to chew," conceded Paul Neuman, IBM spokesman in Rye Brook. "We are still getting the product to the point where we think the quality is what it should be," he said.

XRF was to be the product that would allow users of the IMS data base management systems to keep a mirror image of IMS transactions on a second processor, offering instantaneous backup if the main system were to go down. It was primarily sought by IBM's largest IMS users with extensive data bases involved in financial transactions, such as banks, brokerage houses and insurance companies.

"Some of these companies have hundreds of thousands of dollars moving through the IMS pipeline at any one time. If all of a sudden the pipeline breaks, they're losing money," said Francis Gens, an analyst with International Data Corp., a market research firm in Framingham, Mass.

XRF is actually not one product but a series of enhancements to five other IBM products: IMS/VS Version 2; MVXSP Version 2, Release 1.3; ACF/VTAM; ACF/NCP Version 4; and MVS/XA DFP Version 2.

The number of customers taking part in the early support program is believed to be small, no more than five, and they have been asked by IBM to remain silent on the product's problems, according to Thomas Henkel, senior analyst at the Yankee Group.

"It's the kind of product that you are better off delaying rather than delivering a bad product," he noted. Bugs were found in IBM's own XRF installation in Poughkeepsie, N.Y., and differences between that site and customer sites produced additional installation problems, he claimed.

Henkel estimated XRF may become available during the first half of 1987, but Gens predicted it will be another year before it is out.

Apple encourages third-party vendors at Macworld Expo

By Peggy Watt

BOSTON — Software products led the parade at the second Macworld Expo last week, which drew a liberal mixture of corporate, small-business and hobbyist fans.

Microsoft Corp. reaffirmed its interest in the Apple Computer, Inc. Macintosh with release of Macworks, an integrated package not unlike Apple's own popular Appleworks for the Apple II family.

Ashton-Tate also showed its Dbase for the Mac (see related story, page 10).

Among the handful of other products and upgrades announced were utilities, fonts and peripherals from both large and small vendors.

Technical support organization

Apple itself encouraged more of the same from third parties by announcing its Apple Programmers and Developers Association, a technical support organization for third-party and in-house corporate developers of Macintosh products.

The association is to be run by the Apple co-op in Renton, Wash.

For a $20 annual fee, an individual receives a quarterly catalog of development tools, technical notes and manuals and a newsletter to encourage communication among developers of all Apple products, according to Dan Cochran, manager of languages and tools, who is Apple's liaison to the new group.

"We're trying to serve not just the Lotuses and Microsofts but the hackers and the educators and the DP/MIS managers," Cochran said.

Microsoft's Macworks was enthusiastically endorsed by Apple Chairman John Sculley, who said he finds the package easier to use for most basic tasks than Jazz, a much-touted integrated applications package released last year by Lotus Development Corp.

'Important strategic product'

"I consider this an important strategic product in the continuing development of the Macintosh," Sculley said.

The $295 program, which is due out in September, includes word processing, data base management and spreadsheet with charting functions as well as communications. All of these functions are integrated for data exchange.

It runs on either a Macintosh Plus or a Macintosh with 512K bytes of memory and is available on 400K-byte disks on request.

Microsoft Chairman Bill Gates said Macworks is intended for the general business user, particularly first-time users.

AI progresses slowly toward corporate user mainstream

Technology ready, buyers hesitant

By Eddy Goldberg

PHILADELPHIA — The wait for artificial-intelligence technology to enter the corporate user mainstream continues, with no immediate end in sight.

The latest evidence was last week's AAAI-86, the Fifth National Conference on Artificial Intelligence, where corporate users were few and far between. More than 100 vendors did exhibit, but their promises to link with mainstream computing fell primarily on the ears of developers and academics.

However, there are definite signs of progress. In the keynote address, Herbert Schorr, who heads up IBM's AI efforts, gave the technology a strong vote of support for commercial applications.

"The technology is essentially ready now," said Schorr, group director of products and technology for IBM's Information Systems and Storage Group.

However, he emphasized that it will be knowledge systems combined with existing data processing systems that produce what he termed the second wave for AI.

Money-saving application

Schorr said IBM's San Jose, Calif., manufacturing facility developed an expert system in eight months designed for storage system testing. That application is expected to save the company $5 million a year worldwide, he added.

However, Schorr cautioned users not to attempt too much with expert systems at first. "Find things that give you a good payoff that you can do rather quickly" and build from there, he suggested.

William Kania, manager of the AI marketing group at Digital Equipment Corp., said, "While we're excited about AI technology, we don't want to be carried away with it. AI is only the next step in data processing." He added that users do not want to abandon their traditional means of computing.

One corporate user remained unconvinced that AI can presently address mainstream data processing needs. "Vendors are in a scramble to say they can do something with the IBM world, large and small," said Ralph T. Shuey, senior research associate with Chevron Oil Field Research Co. in La Habra, Calif. But after searching the offerings on the show floor, he concluded, "Not many have yet."

Shuey, who has been working with symbolic processing machines for the past 2½ years, said the biggest barrier he has experienced in bringing AI into mainstream computing concerns the issue of computers as workstations vs. centralized computer systems. "Much of AI comes from people with workstations that they own or access on a network. The world I have to port AI to is very centralized," he said.

Michael L. Schneider, vice-president of technology research at Manufacturers Hanover Trust Co. in New York, said that although AI has moved from science to engineering in the past two to three years, he wants to run expert systems on the machines he does business with, IBM mainframes.

"I'd like to be able to develop on a symbolic processing machine with LISP for its development power and turn around and deliver it on a cost-effective environment," Schneider said. The key is cost-efficiency, he added, whether on a personal computer or a mainframe. "Am I going to get a return on my investment?" he asked.

Corporations unconvinced

Another hurdle AI is facing in entering the marketplace is that in many corporations it is still an educational, missionary sell; it will remain so until users are convinced it can offer real solutions to everyday commercial problems and can run on their existing hardware and software.

"There is a major learning curve you have to go through before you see how to use these tools. It's really not apparent to corporate people," said independent application developer Ron Ortscheid of Ortron Development Corp. in Buffalo Grove, Ill.

"I had some difficulty before I came to the show seeing how I could use this technology," he said. "But I suspect that once you cross that learning curve, you'll find it valuable."

Carnegie Group upgrades expert systems tools, adds interactive graphics package

PHILADELPHIA — The Carnegie Group last week announced Version 3.2 of Knowledge Craft, its software development environment for constructing expert systems.

Knowledge Craft enhancements include upgraded performance for OPS and Prolog as the result of improved compilation techniques, the addition of macro functions and improved debugging.

The company also announced two new products along with Version 3.2 — an interactive graphics package for creating two-dimensional screen images and a run-time LISP version of Knowledge Craft. Both are set for the second-quarter availability.

In addition, the Carnegie Group will introduce Knowledge Craft on conventional 32-bit workstations by the end of the year, specifically, on Digital Equipment Corp.'s Microvax-based AI workstation and the Hewlett-Packard Co. Series 9000 Model 320. Ports are also being built to Sun Microsystems, Inc.'s Sun-3 workstation, Apollo Computer, Inc. workstations and IBM's RT Personal Computer.

"Many 32-bit workstations have reached the point where they are, in many ways, competitive with specialized AI machines," said Carnegie Group President Larry Geisler.

Carnegie also will introduce two knowledge-based tools for embedding AI within conventional data processing applications.

The low-end product will run on a personal computer, be written in the C programming language and include a compiler and editor.

The second, upwardly compatible product, will include extended knowledge-representation and inference capabilities for solving larger problems. It will include a SQL-like interface to allow expert systems to directly access information stored in popular commercial relational data bases and allow conventional programs to access its knowledge bases.

These products will be released in multiple languages beginning with C and Common LISP and will run on IBM mainframes and DEC minicomputers as well as on the IBM RT PC and Sun-3. They will provide a migration path to Knowledge Craft.

In addition, Carnegie is developing software products for computer-integrated manufacturing that will combine conventional programming and AI techniques.

"What Lotus 1-2-3 did for accounting, these packages are designed to do for a production environment," Geisel said.

— Eddy Goldberg

Burroughs strengthens commitment to IBM compatibility

Bridge, PC emulator BTOS windows to bow

By Alan Alper

NEW YORK — Burroughs Corp. last week unveiled a trio of products enabling its family of B25 workstations and its XE 520 shared resource processors to communicate better within IBM shops.

At a New York press conference, Burroughs unveiled a bridge enabling documents created on its B25s and XE 520s to be exchanged with IBM workstations running its Distributed Office Support System (Disoss).

The company also announced an IBM Personal Computer emulator that allows Burroughs B26 and B28 workstations to run application programs written for use under Microsoft Corp. MS-DOS and a windowa product for B25 family workstations running its BTOS multiuser, multitasking proprietary operating system. All three products will be available beginning in September, according to Burroughs.

Burroughs said its new products reinforce the commitment it made one year ago to providing increased IBM compatibility for its users.

"These are checklist items you have to have in office automation," said Louis Giglio, a market research analyst with Bear, Stearns & Co. in New York. "Burroughs is incredibly late, though, with the bridge. Even Hewlett-Packard Co. and Wang Laboratories, Inc. already have one."

LeRoy W. Beers, Burroughs vice-president of the Distributed Systems Group, noted that the firm has been successful penetrating IBM accounts despite its products' lack of IBM compatibility. Approximately 30% of the 130,000 B25 family workstations shipped to date are operating within IBM-dominated ahops, he said.

'Should make us stronger'

"We've been successful without a good bridge to IBM," Beers said, noting previous communications centered on IBM 3270 emulation. "These products should make us even stronger," he added.

The bridge, called OFISbridge, allows word processing documents or other files created on B25 workstations and XE 520 shared resource processors to be integrated within Disoss, IBM'a mainframe-based OA system. OFISbridge, priced at $2,300, uses a BTOS Systems Network Architecture (SNA) gateway and Burroughs' implementation of LU6.2 to access the distribution and library services provided by Disoss.

OFISbridge converts documents to IBM's Document Content Architecture and Document Interchange Architecture. It uses menus based on the IBM Displaywriter's Electronic Document Distribution System. Burroughs workstations using OFISbridge do not require additional software or modifications to existing software to communicate with an IBM host, the firm noted.

The B25 cluster workstations can access the OFISbridge and SNA network gateway via a standard cluster line. All BTOS files residing on B25 workstations can be exchanged with other B25 systems or Disoss workstations through the Disoss host, Burroughs noted.

The IBM PC emulator module snaps onto the logic unit of B25 workstations and enables the processors to run IBM Personal Computer AT software packages. The Intel Corp. 80186-based unit, priced at $1,145, has 768K bytes of internal memory and Phoenix Software Associates, Ltd. read-only memory BIOS for compatibility under MS-DOS 3.1.

Asked why it took so long for Burroughs to offer MS-DOS compatibility for the workstations, considering the IBM PC has been the de facto standard for the last three years, Michael Brewer, Burroughs' general manager of workstations and office systems, said it was a matter of priorities.

"There were a number of things we wanted to do with BTOS so it would be a better solution for the small business environment, rather than application solutions that followed PC compatibility" he said.

Bear, Stearns' Giglio said the PC emulation module should hold Burroughs B25 customers in line. "It won't get them any incremental sales but most likely will preserve the base they already have."

BTOS Windows enables B25 family workstations to create up to 10 overlapping and variable size windows. It allows concurrent operation of a Disoss sessioo from one window, an MS-DOS application in another and a BTOS application in a third, Burroughs said.

Prices for the package range from $250 for a stand-alone workstation to $375 for a version for clustered workstations.

DG: Upgrade 'delay' strategic

By Donna Raimondi

Data General Corp.'s dual-processor version of the MV20000 superminicomputer, announced in November 1985 with a 120-day shipping date, has just begun reaching customers in the third quarter. The Westboro, Mass.-based company denied the delays are due to problems and said it is encouraging customers to fully utilize single-processor versions before converting them to the more powerful model.

Rumors persist that the Model 2 version of the top-of-the-line MV20000, which was originally scheduled for delivery 30 days after the Model I uniprocessor, which had a February shipment date, is only now shipping because of problems with processor chips as well as the operating system.

But Tom West, DG's systems division vice-president, said that the system is shipping according to plan, that it has no hardware or operating system problems and that DG had planned all along to ship the uniprocessor model first and then upgrade as customers needed the dual-processor Model 2.

Installation slows delivery, report says

In a July report, New York investment firm Salomon Brothers, Inc.'s Marc Shulman wrote that customers who had ordered the Model 2 were supplied by DG with a Model 1 instead. Complexities in installing the larger system are slowing down delivery dates, the report said. In the absence of a proven dual processor, DG's competitive position against Digital Equipment Corp.'a Vaxcluster is weakened, the report claimed.

A customer who received the dual-processor upgrade to his MV20000 in mid-July said that reports of faulty equipment or software are wrong. "We haven't had any problems with it," said Dennis Peck, senior vice-president of Professional Hospital Services, a division of American Medical International, which provides information processing products to 157 hospitals. "The Model 2 was a little late getting here," Peck said, but it is the "most robust hardware and software that we have ever received from DG, and we've been using their products since 1980."

Peck said he received his Model I in April and the Model 2 upgrade in mid-July.

"We have had very few problems running customer applications on the Model 2," said Jan Pieter Scheerder, DG's director of performance analysis for customer benchmarking. "Most of the problems really come from people getting used to a dual-processor architecture and what happens to an environment when you do that."

Taking advantage of a dual processor means special planning and scheduling, Peck said. "You have to think through which jobs you can run in parallel to get peak performance." DG is installing Model Is in customer sites that order Model 2s until that customer's Model 2 configuration is optimized at DG's facilities, a DG apokesman said.

"That was really the expectation all along," West said. "We probably were not explicit about the fact that we thought a prudent way to lead our customers was to install a single I/O channel first and then to upgrade to multiple I/O channels. But that has been our customer and account strategy all along. . . . We don't tend to put those strategies in press releases."

A part of the perceived problem with the dual processors, according to DG's Scheerder, is customer expectations. The dual-proceessing architecture benefits performance only on jobs that require multiple processing or in ahops running jobs concurrently. "If you have a single-threaded job that only runs on one processor by its very nature and design, a dual processor is not going to do anything for you," he said. "And a dual processor is not going to give you a boost if you haven't utilized the full capacity of the first processor. So again, we have to manage those expectations."

World Digest

Japan tech mart weakens

TOKYO — The recent bankruptcy of a major Japanese office equipment venture, Miroku Keiri Co., provides another signal that the lucrative Japanese market is deep in the throes of transition. Analysts forecast that the big industry names, including Fujitsu Ltd., NEC Corp. and IBM, will increasingly use their financial and technical muscle to take control of Japan's office marketplace.

Miroku's collapse, the largest to date for a Japanese venture firm, sent shock waves through the domestic industry because of the firm's fast-paced growth in the last decade, pushing it toward becoming a $149 million-a-year vendor of terminals and software. "We are at a loss how to respond to this completely unexpected failing," said a spokesman for the Taiyo Kobe Bank, one of Miroku's partners.

W. German DP jobs on rise

MUNICH — The demand for data processing professionals increased dramatically in West Germany during the first six months of 1986. Companies published about 7,000 job listings in West German trade journals during the first half of the year, up 40% from the same period last year, according to employment counselors SCS-Personalberatung.

According to an SCS report, software and system houses need qualified DP personnel. Recruitment companies, most of which are in the data processing area, report an intense demand for computer professionals.

During the previous 12 months, DP recruitment dropped off, but companies are now trying to beef up their staff. Computer-aided design and manufacturing specialists, who display the highest growth rate of any professional category, may find more than twice as many openings than during this time last year.

Asia latches onto HP RISC

HONG KONG — Hewlett-Packard Co. has sold its first HP 3000/930 reduced instruction set superminicomputer in Asia. Hong Kong is expected to be the first Asian 3000/930 site, with two machines destined for a pair of government technical institutes opening this fall.

In Malaysia, an unspecified user — believed to be another government training institute — will take a third 3000/930 supermini later in the year, and a Taiwan textile manufacturer will opgrade its existing HP 3000 by the beginning of 1987.

The total value of the four sales is estimated at $3.5 million. HP has also received an order for its HP 3000/840 technical Spectrum, from Tokai University in Japan.

Rated at the equivalent of 4.5 million instructions per second on a complex instruction set computer, the 3000/930 will rank as Hong Kong's most powerful processor in the education sector.

Japan's telecom decline

TOKYO — Japan's telecom gear output in May grew only 1.5% from a year ago to $883.2 million in value, owing to a 19.7% decline in eaport contracts during that month, a recent industry report said. Because of the bullish Japanese yen against the U.S. dollar, the shipment to the U.S. was hit hardest, decreasing 37.8% annually. Imports also dipped 15.8% to $18.5 million.

NTT goes on U.S. field trip

TOKYO — Nippon Telegraph and Telephone Corp. (NTT) sent a 14-member mission to the U.S. to study expert system applications at major local firms, including Digital Equipment Corp. and Boeing Co. During its 13-day stay, starting Aug. 10, the NTT delegation was also scheduled to attend a Dataquest, Inc. seminar on artificial intelligence and an AI show in Philadelphia.

Robotics healthy in Japan

TOKYO — Japan's robotics production in 1985 rose 18.5% to 48,490 units, up from a year ago. According to a recent Japan Industrial Robot Manufacturers' Association report, the dollar value of last year's output was also up 21.3% to $1.95 billion. The growth was attributed to a sharp hike in demand from the automobile and precision machinery industries. Deliveries to those industries rose to 7,600 and 2,600 units, respectively.

IBM in Australia doghouse

MELBOURNE — IBM has angered users in Australia and New Zealand by greatly increasing the price of an enhanced CICS performance analysis tool.

Users claim the price hike is too high, regardless of the enhancements, and, rather than pay the extra, they are evaluating equivalent third-party software packages. IBM's CICS performance analysis tool, CICS Pars/MVS is intended to accompany its most recent CICS/OS/VS 1.7 release. It reportedly costs 10 times as much as its predecessors, CICS/Pars and PA II.

Borland ranks No. 1 in UK

LONDON — Borland International, Inc. jumped to the top slot in UK business software sales for June 1986, according to Softsel Computer Products, Inc. UK ratings.

Borland's Turbo Prolog captured ths No. 1 position, outselling Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Multimate.

In addition, Borland's Turbo Pascal was listed third and its Sidekick held fifth place among the top 10 business software products for the month.

Turbo Prolog, Borland's first artificial intelligence product, shipped in April of this year. By May 31, less than two months later, more than 30,000 copies had been sold worldwide.

In spite of price cuts, decline of IBM PC seen on horizon

By David Bright

Although IBM has reduced the direct sales price of its basic Personal Computer by as much as 22%, the corporate market seems unimpressed. The cuts, which come on the heels of dealer price reductions in July and retail price reductions in April, further indicate that the end is near for the 5-year-old PC, observers say.

The price reductions were made ostensibly to combat the large number of lower priced clones that have been stealing market share from IBM. But the PC has a "limited life span" and may be phased out by year's end, comments Raymond Falls, an associate editor at Datapro Research Corp. in Delran, N.J. He claims IBM is simply trying to clear its inventory of the older machines. Compared with the PC, "the XT is much better designed, has more slots and uses fewer chips, so it's a little cheaper to make," Falls says. "Since you can buy the XT now without a hard disk drive, there is really no need for the PC."

However, an IBM spokesman indicates otherwise. "We are still manufacturing these models and obviously still marketing them," he says.

The spokesman says the price reductions were made to bring parity to direct sales prices and those offered by dealers.

"It's very encouraging that the price is coming down, but I don't want one," states Cheryl Currid, manager of sales, systems, planning and information at Coca-Cola Foods, a division of Coca-Cola Co. in Houston. With outdated features like a 4.77-MHz Intel Corp. 8088 microprocessor, five expansion slots and a 65W power supply, the PC is "not an acceptable business computer," Currid says. "The problem with the PC is that IBM has the slowest IBM compatible on the market," Currid quips.

Echoing Currid's views, the information services manager at a Michigan manufacturing corporation says his company has never purchased PCs and now requires Personal Computer AT-level power in many cases. For typical office applications, such as Lotus Development Corp.'s 1-2-3, the PC simply is not fast enough, he says.

The price cuts took effect on Aug. 1 and became public last week. The price of a PC with 256K bytes of memory and two floppy disk drives, formerly $1,995, was reduced 20% to $1,595; the price of the same model with one floppy disk drive dropped 22% from $1,845 to $1,445, and the price of a 64K-byte PC with no disk drives fell 16% from $1,390 to $1,165.

VIEWPOINT

EDITORIAL

MIS and the Macintosh

The occasion of last week's Macworld Expo in Boston and the announcement of products by Ashton-Tate and Microsoft Corp. for the Macintosh present a handy opportunity to assess the system's status 30 months after its spectacular debut. Our conclusions are twofold.

1. The Macintosh has not been the runaway success that would knock IBM out of the personal computer ring, as some top Apple Computer, Inc. officials actually predicted in January 1984. (For the record, it was the most vocal of those officials, Steve Jobs, who was knocked out of said ring.)

2. Failure to achieve No. 1 has not meant that the Macintosh has dropped out of sight. On the contrary, the machine has a legion of adherents, and their corporate ranks appear to be growing.

Apple's problem with marketing the Macintosh to business users has always been its failure to give enough of these users a sound reason for buying the machine. Corporate users are looking for tools and solutions; the Macintosb offered neither and instead struck many as an overly indulgent technical plaything. The Macintosh was too slow, offered little available software, did not connect with other machines and had a closed architecture.

Much of this has changed, is changing or will soon change. The original 128K-byte machine has been upgraded, first, to 512K bytes and then to the 1M-byte Macintosh Plus, which is faster than standard 640K-byte personal computers. The software shortage has been resolved, in some cases (vide Microsoft's Excel) impressively so. Connectivity tools exist, notably 3Com Corp.'s Ethermac, though not yet in profusion. And closed architecture solutions — namely IBM PC-DOS and Unix capabilities — have been promised by Apple for a year and are now said to be scheduled for release at next January's Apple stockholders' meeting.

Meanwhile, corporate computer uses have become more diversified and corporate computer managers more sophisticated. These developments are not without their irony, as they pertain to the Macintosh and MIS. It now appears that the very DP/MIS executives whom Apple depicted as the enemy incarnate when the Macintosh was unleashed in 1984 may turn out to be the system's most effective champions within the corporate computing world.

At the time the Macintosb debuted, DP/MIS was scrambling to get control of the rapid proliferation of PCs withio their organizations. With this objective largely achieved, and the majority of PCs installed as word processing and spreadsheet tools, information systems managers have been able to turn their attention to other areas of computing need.

While not abandoning their push for Macintosh connectivity and compatibility, they are better able now — having established an organizationwide information management strategy — to appreciate the Macintosh's technical virtues, to define a specific role for it within the corporation and to promote it as a desktop publishing solution or a low-end engineering workstation.

Apple's corporate battle on behalf of the Macintosh is far from over. But the prospects for a significant victory are far rosier now than at any time in the past 30 months.

LETTERS TO THE EDITOR

No representation in true democracy

A recent letter to the editor, "Computers give power to the people" [CW June 30], discussed the use of computers to enhance democratic participation by citizens.

Technically, the form of government in the U.S. is a republic, not a democracy. This means that the citizens elect persons to represent them in enacting federal law: people who understand the complexity of the issues, political maneuvering and the funding bills to which the writer refers. The framers of the Constitution realized that citizens were not sufficiently informed to make choices on each and every piece of legislation.

Even in today's society, with dramatic advances in communication, citizens have little hope for understanding the complexity of more than a few of the major issues. Also, one of the functions of any government is to protect its citizens, including minorities. A republic is best equipped to perform this functioo because the representatives act on behalf of a larger population, including minorities.

The writer is advocating a true democracy in which each persoo has a direct voting impact on the legislative process; the notion of representation in a republic is gone.

Also, the opportunity to amend legislation before passage is gone. True democracies are characterized by a sense of every man for himself, mob rule and tyranny of the majority. The protection of citizens becomes very difficult.

It is true that computers have great potential for disseminating information regarding legislation. Some possibilities are informing citizens of current legislation, informing citizens of the voting track records of representatives and electronic mail for citizens to express opinions to representatives.

But for the reasons stated above, a true democracy (computerized or not) is alarming, and a "democratically computerized world government" is highly dangerous.

Bob Farnham, Director
Computing Services and Systems
Graceland College
Lamoni, Iowa

Multiuser system 'close, but no cigar'

In regard to Mr. Kapsales's Reader's Platform, "Limited technology must take blame for current PC slump" [CW July 28], I can only echo the old carny cry of "close, but no cigar." A lack of technology is probably to blame for the slumping personal computer sales. And, Kapsales does indeed identify (if not clearly and explicity) the lack of clean and simple methods to share information. His response, the multiuser machine, is incorrect.

The one-CPU-per-user principle has some very definite advantages:

- Reliability — a fault affects only one user, not a group, and the PCs I have used have all been more dependable than the mainframes and minis.
- User knowledge — there are now many users who can use PCs, bringing end-user needs, knowledge and experience to the solution of business problems. The various programs for the PC have proven track records in the areas Kapsales lists as being of most interest. This is not true of the multiuser systems.
- Flexibility — in two important respects. The user can configure a system to answer specific needs, not accept a generic solution. And for the first time since the late Middle Ages, a user can work with the tools and in the manner best suited for him, while still producing output that is acceptable to and usable by all.

The lack of technology is what defines flexibility. We atill do not have the products that will allow users to pass information easily and cleanly. And until we do, the PC market will probably remain flat. If the best solutioo that arrives is the IBM 17-layers of separately purchased and paid-for products, the market may never recover.

Kapsales's solution is to scrap the PCs and reinvest in multiuser hardware. That may appeal to a Big Eight consultant or to someone who wants to push end users out of controlling computing resources, but it is not the best way for a company, or an industry, to prepare for the changes ahead.

Steven Newton
Shorewood, Wis.

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VIEWPOINT

Chips for brains: Computers built with neural networks

When was the last time you got hold of a brain? I'm not talking about somebody overly smart, or even sweetbreads. I'm talking about a brain, as in cerebellum and gray matter.

Most of us never think about brains, unless we deal with people who have none. But if the research community has its way, the next generation of computers will be modeled on the actual physical structure of the human brain.

In the last year, a number of research laboratories around the country have been rallying behind the concept of semiconductor brain duplication, or neural networks. The activity has been triggered in particular by success stories from researchers at Johns Hopkins University and AT&T Bell Laboratories.

Neural networks vs. linear architecture

And now, with recent announcements from both Texas Instruments, Inc. and TRW, Inc. that they are getting ready to commercialize neural network technology, people are saying the next big thing is to get rid of our standard, linear, von Neumann architectures.

Simply stated, neural networks are attempts to physically reconstruct the brain with semiconductor technology. Connections between chips are patterned after nerve cell interconnections via dendrites and synapses. Instead of linear connections, the individual processors have multiple, three-dimensional connections and are able to access the appropriate neighbor chip (located above, below, next to or diagonally), according to need. In effect, each chip strives to exist as both a single autonomous unit and as an integral component of the complete machine.

This means that each chip can take separate but mutually beneficial paths to solve different pieces of a problem simultaneously, thus avoiding the bottleneck that occurs when processing is done linearly, or one step at a time. An added benefit is that if certain processors break down, other functioning processors can work around them and even pick up their work load.

In theory, this sounds wonderful for the future of all types of computing. Read on.

Let us start by examining what TRW is doing with neural networks. The company has introduced a commercial version of a machine it developed under cootract to the Department of Defense called the Mark III Artificial Neural System Processor.

The Mark III costs $53,000 and uses a Digital Equipment Corp. VAX as its host system. The machine can have as many as 8,000 "neurons" and utilize roughly 500,000 interconnections.

Compare this with the almost 10 billion neurons in the brain, which have an estimated 10 trillion interconnections. With the current Mark III packaged in a box that is 24- by 18- by 12-in., a portable TRW version of a fully configured brain would probably be the size of Cleveland.

However, the focus of using the neural network is not really the same as that of mainstream computing. The systems we currently utilize on a daily basis are merely efficient calculators. They do one thing that humans are not good at — number crunching.

By HARVEY P. NEWQUIST

This takes on forms that are primarily adult in nature: accounting cost-modeling, storing facts, controlling inventories and so on. However, computers have never been capable of the kinds of things that children are good at (and which become second nature in adults), such as learning, utilizing senses, making cognitive associations and combining unrelated experiential data to produce new data.

The senses, in particular, are where computers fail to compete. Why? That is easy enough to answer by picking one of the senses — sight — and comparing its components with those used by machines, based on data such as the following from the University of Toronto's Playfair Neuroscience Unit: While the retina requires .0001W, a product with integrated circuits needs at least 200W. A retina weighs less than one gram, its machine counterpart more than 20,000 grams. Retinal gates total 25 billion vs. the chip-based product's one million. Finally, lead traces in the retins are fewer than three microns, those in a chip-based product, 250 microns.

As you can see, we are not quite there yet.

Hope to mimic sensory communication

Neural network machines hope to change the current state of affairs by utilizing the multiple-access, multiple-processor approach in mimicry of brain cell and sensory communication. At least that is what researchers hope will happen. You see, nobody knows how sensory communication works; nobody even knows how the brain works. And relative to neural networks and their brain-like architectures, it has been surmised that this undertaking is akin to building a model of a bird and expecting it to be able to fly and make little birds.

This is not deterring some researchers from looking into the possible production of the machines for use throughout the commercial market. New designs are under way at such institutions as Brown University, California Institute of Technology, Carnegie-Melloo University, University of California at San Diego, TI, AT&T and even IBM. The TRW machine is just the first to come, and bets are that there will be more.

And as these organizations start to move their man-made brains out into the world, you cannot help but think that Victor Frankenstein would be proud.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Balancing technical perfection and political realities

The report of the Rogers commission on the shuttle disaster contains important lessons for everyone in data processing — indeed, for anyone involved in an enterprise revolving around technology.

The very high stakes of the National Aeronautics and Space Administration's mission made for the extreme situation that so often reveals interorganizational conflict in sharp relief.

Looking past the specifics of the Rogers report — the details of O-rings' seals on the booster rocket and who said or did not say what when — one sees that the report documents an all-too-human phenomenon: the tendency to buy harmony at too high a price, to dismiss unpleasant nay-sayers as Chicken Littles.

Additionally, the report reinforces research that has repeatedly found technologists to be a fairly conservative lot who are quite unenthusiastic about dissenting noisily — in public. Technical folk, it would seem, only blow the whistle when every other warning device has gone unheard.

One of the problems the report describes is a variation on the timeless sales vs. engineering conflict. The folks in sales are usually impatient for new products they know are coming, fearing that the windows of opportunity they see open may shut on them prematurely. In this case, the sales staff was NASA's own top-level executives, its congressional and other political supporters and its vendors and suppliers.

By HOWARD A. KARTEN

At the same time, engineering almost always wants more time to perfect the product, to tweak it a bit more, to add more value or more reliability. Programmers and engineers can become too attached to their creations, losing sight of the forest for the trees.

Everyone in DP, whether on the management or technical side, learns about this conflict early on in their careers. DP professionals believe disaster will ensue if they are not given more time to debug, tweak and enhance their systems, whereas the opposing group wants the product made available yesterday. This is true whether the opposing group is a user department in the same large organization or the sales department of a company selling hardware or software.

In the process of dissenting, some DP staff members make themselves offensive to managemeot. The real issue is resolving DP judgment with sales judgment and organizational needs. Studies of DP professionals and engineers seem to indicate that technologists are not alarmists and certainly not eager to stir up problems for no good reason. Unfortunately, few organizations have managed to institute adroit methods of dealing with this kind of dissent.

And many DP professionals have often not been especially adroit at using the system to redress their concerns. (Incidentally, one of the dissents in the otherwise wimpy report, written by commission member and Nobel Laureate Richard Feynman, was a stinging criticism of NASA and its contractors. Feynman's recent book, *Surely You're Joking, Mr. Feynman*, is entertaining, enlightening and must-reading for anyone seeking a greater understanding of technically oriented people.)

Ignored problems do not go away

One of the points that the Rogers commission report makes, indirectly, is that ignoring problems does not make them go away. A problem ignored is a problem that is festering. Another point is that organizations need more formal processes for resolving disputes. Perhaps one answer might be organizational ombundsmen.

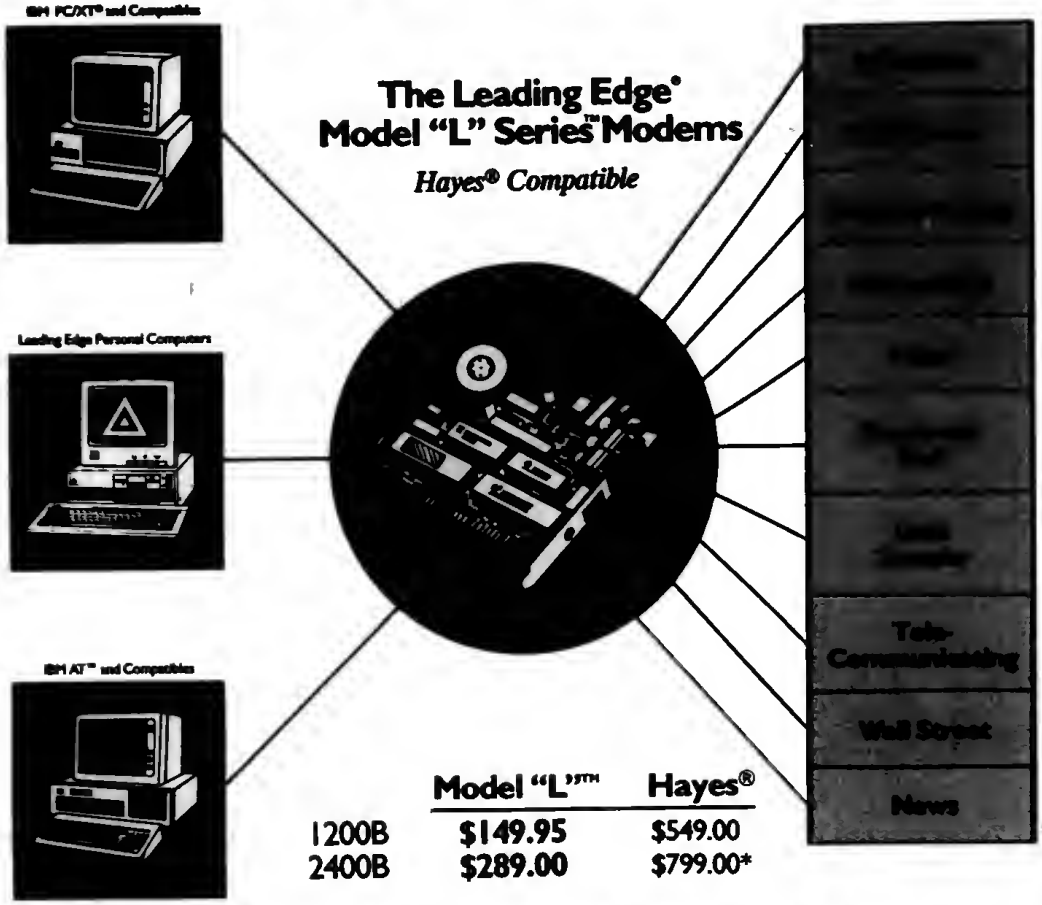
The technological change that is second nature to anyone working in the computer business obviously produces change in the social and organizational environments. With all that change going on around us, it is easy to fall into the trap of thinking that fundamental aspects of human behavior may have changed as well.

It is easy, too, for those who are intimately involved with technology, as DP professionals are, to become seduced by the idea of the technological fix — that technology can solve all kinds of problems.

So it is good to be reminded periodically that some problems are eternal, despite changes in the technological arena.

Karten has been involved with computers for two decades as a programmer, systems analyst and DP manager and is author of How to Profit from Dow Jones News/Retrieval.

Make the Connection



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COMMUNICATIONS

Telcos sell cable scheme as standard

By Elisabeth Horwitt

Challenging AT&T's and IBM's inroads into the building cabling arena, divested Bell operating companies Diamond State Telephone and Bell of Pennsylvania recently announced the Universal Information Transport Plan, a wiring scheme they claim supports any brand of computer at data rates of up to 16M bit/sec.

The two Bell Atlantic Corp. operating companies hope to make the Transport Plan a de facto wiring standard, said John Balerini, marketing network architecture staff manager at Bell of Pennsylvania. "In the absence of industry standards, each system has its own wiring specifications, and when you change the system, you have to rip out the wiring. IBM, Wang Laboratories, Inc. and Digital Equipment Corp. make cabling to lock out other vendors, so people will buy their products. Customers ask us, 'Why can't we have one type of wiring?' "

Under the Transport Plan, computers and other devices are linked to existing wiring closets via shielded twisted-pair cable plugged into telephone wall jacks. A system can be unplugged from one jack and moved to another "by an ordinary user — no need to send out a technician," Balerini claimed.

Two twisted pairs are designated for high-speed data transmission. The cabling has been tested to support up to 16M bit/sec. data rates over a maximum distance of approximately 100 feet between the workstation and wiring closet. Bell of Pennsylvania now has customer sites that support 8M bit/sec. rates. "We have no 16M bit/sec. installations right now because there currently are no network products that support that speed," Balerini said.

An additional four twisted-pair wires support central office-based data and voice services such as Centrex and Central Office-LAN, a 19.2K bit/sec. data network. The wiring specifications also conform to the Integrated Services Digital Network,

See TELCOS page 20

Network managers debut, analyze traffic for basic, high-level needs

By Stanley Gibson

Two centralized network management systems announced recently target user installations at opposite ends of the spectrum. Engarde, from Doelz Networks, Inc., manages major user installations costing $1 million or more; the 5110, from Case Communications, Inc., is an entry-level version of the Case 5000 series of management tools.

Both products collect, store and process diagnostic and traffic information from wide-area network interface devices. The network manager can thus monitor and troubleshoot the network from a central location. Both products can also generate reports on traffic patterns and usage trends for capacity planning and billing purposes.

Engarde, from Irvine, Calif.-based Doelz, is based on a Masscomp Corp. MC5500 graphics workstation with windowing capabilities. The workstation correlates information gathered with Doelz Esprit One and Elite One switches and concentrators. Network conditions are stored in the computer at 30-sec. intervals.

The workstation can graphically display major nodes and, using a zoom feature, smaller nodes within the major nodes. The color graphics workstation runs under RTU, Masscomp's real-time Unix operating system. It features a 71M-byte, 5¼-in. fixed disk.

The information is stored and accessed through Unify Corp.'s Unify relational data base management package. Visual Intelligence Corp.'s Dataviews is used for graphics operations.

According to President Frank Connors, Doelz plans to build future network management systems around high- and low-end Masscomp workstations that have not yet been introduced.

Engarde saved Seattle First National Bank from having to hire additional network management staff when it replaced an outdated network system with a $2 million to $3 million Doelz network, said Gary Scroggs, assistant vice-president and manager of network utilities.

See NET page 21

Micom ups networking capabilities

Expansion cards add protocols, capacity

By Elisabeth Horwitt

SIMI VALLEY, Calif. — Packet-switching and hub-networking capabilities, as well as greater power, are among the features Micom Systems, Inc. has just announced for its Micom Box multiplexer line. The company also unveiled a variable-speed dial-up modem.

Micom Box 3 is a more powerful version of its predecessor, Micom Box 2. Both products function like generic data communications devices that support a variety of networking capabilities. Additional functions can be added by inserting software Featurepaks into the expansion slots. "The user can start with a concentrator network and go to an X.25 packet assembler/disassembler (PAD) and then an X.25 switch by simply swapping Featurepaks," said Chris Kenber, vice-president of marketing operations.

All products in the Micom Box line can support modem boards that provide AT&T Dataphone Digital Service connections. The basic Box 3, supporting four 19.2K bit/sec. channels, is priced at $1,790 and is available now. Expansion cards supporting six channels cost $1,250.

Micom also announced six Featurepaks, three of which support X.25 packet-switched networking functions. "The Micom Box is a cornerstone of our low-end line of X.25 networking products," said Gregory Toussant, director of X.25 products.

The asynchronous packet assembler/

See MICOM page 20

INSIDE

NEW THIS WEEK

- GTE Supply enhances Trailblazer modem
- Brooktrout Technology offers a voice messaging system

For more on these and other new products, see pp. 75-85.

INSTANT ANALYSIS

"So far, Open Systems Interconnect protocols allow you to build a network of computers but not a computer network, because crucial resource management capabilities are still lacking."

— John Haefner, chief of systems and network architecture division, National Bureau of Standards

Telcos sell cable scheme as norm

From page 19

Balerini said.

The Transport Plan's high data rates "enable the customer to support IBM's 4M bit/sec. network, or Wang's 4M bit/sec. network, or a 10M bit/sec. Ethernet on the same cable," Balerini claimed.

Bell of Pennsylvania technical support people work with customers in order to tailor a building's wiring scheme to specific communications and systems needs, he added. "We will take responsibility for connecting various systems and for diagnosing problems in wiring and baluns — everything up to the communications controller," Balerini said.

Other operating regional companies within Bell Atlantic should start offering the Transport Plan before the end of the year, Balerini said.

"AT&T does not see Bell of Pennsylvania as a competitor, because our Premise Distribution System [PDS] wiring scheme already addresses the needs of our business customers," an AT&T spokesman said.

PDS, an unshielded twisted-pair wiring scheme that supports 1M bit/sec. transmissions, "was designed to keep network prices down by allowing customers to use existing cabling," he added.

Installation costs for Universal Information Transport Plan wiring range from $300 to $600, according to Bell of Pennsylvania.

"Cost could become an important issue" in the battle for cabling supremacy, according to Lee Doyle, senior analyst at Framingham, Mass. research firm International Data Corp. (IDC) "IBM's cabling is quite expensive."

Doyle disagreed, however, with Bell of Pennsylvania's claim of offering the only "universal" cabling system around. "There is no question that a lot of different systems will run on IBM's Token-Ring and Cabling System," he commented. "And AT&T and DEC both call their cabling systems multivendor."

"What could be less vendor-specific than unshielded twisted pair?" said the AT&T spokesman, noting that PDS supports AT&T's Information Systems Network and Digital Multiplexed Interface, both of which can link third-party vendors' hosts and terminals.

"Both the IBM Cabling System and the Token-Ring are open systems," an IBM spokeswoman said. "We have made documentation for both products available to third parties, and a number of vendors say that they are attaching their products to the Cabling System."

Earlier this year, DEC announced Decsite Services to help customers plan, design and build custom — and multivendor — installations of the Decconnect wiring system and Thinwire Ethernet.

While admitting that "technologically and costwise, they have something," Doyle expressed doubts about the size of the Universal Information Transport Plan's potential market. "How many companies will rewire existing buildings unless they are Big Blue shops with deep pockets or have very specific data needs?"

According to an IDC survey, many firms have stand-alone hosts and a local-area network but "are skeptical of one cabling scheme that will satisfy all of their networking needs," Doyle said. "Why install a 'universal' wiring system until you're sure what it will be supporting?"

Micom ups networking

From page 19

disassembler, which conforms to the 1984 CCITT standard, is priced at $500 and is available now. A 3270 bisynchronous PAD is priced at $1,950 and will be available in September. This version of Micom's synchronous PAD has the ability to collect performance statistics as well as network accounting and billing information. The X.25 packet switch is priced at $1,950 and is available now.

In the network concentrator arena, Micom unveiled the Enhanced Wideband Multiplexer, which supports 48K, 56K, 64K or 72K bit/sec. transmissions. It will be available in September for $600. The Enhanced Synchronous Multiplexer, available in October for $500, provides up to eight synchronous lines in addition to asynchronous channel support.

The Concentrator Switch, available in September for $600, performs as a network hub for up to 10 Micom Box or Micro800/2 data concentrators serving up to 255 user and computer ports. The switch interconnects multiple asynchronous channels originating at different Micom data concentrators, "so that users on any Box can talk to each other," explained Byron Henderson, director of marketing for the concentrator group.

"The switch enables multiple users on multiple Boxes to communicate, without needing direct links between each pair of data concentrators," Henderson added.

Micom also announced the Modem Dial Series 3124, which handles data rates of 300, 1,200 and 2,400 bit/sec. and conforms to AT&T Bell Laboratories 103A and 212A and CCITT V.22 standards. The product also supports communications software developed for the Hayes Microcomputer Products, Inc. AT Smartmodem command set. The Microcom Networking Protocol, another standard feature, provides error checking and correction over dial-up lines. Available in September, the modem will list for $549.

Interpath system allows PCs to recognize voice commands

By Eddy Goldberg

SANTA CLARA, Calif. — Interpath Corp. recently introduced Voicecommand C25, a $199 voice recognition system that allows a reported 99.9% accurate verbal operation of most programs written for the IBM Personal Computer and compatible machines.

Voicecommand allows the PC to recognize and accept the user's voice as an alternative to keyboard entry of commands and data, according to Interpath President John McAfee.

Users can define common commands like Load File, Print and Create Graph, which remain in the system for future use with any software package. Common verbs, nouns, numbers and names also can be defined as voice commands.

'Powerful tool'

"Voice recognition is a very useful and powerful tool, but it has been out of the reach of individual PC users," McAfee said. "Putting the price below $200 opens up the capability to almost everyone."

McAfee said the reported 99.9% accuracy is the result of Voicecommand's front-end signal processor, which has a very high noise filtering capability and gives a much cleaner signal than most available systems.

Interpath has developed a new architecture in which the recognition process is done in software using standard IBM PC hardware, McAfee noted.

Translates spoken word

The software intercepts the keyboard interrupts and translates the spoken word into a series of up to 1,000 user-defined keystrokes per word or command, according to McAfee.

Voicecommand's menu option enables users to define voice menus that can be used as substitutes for the usual on-screen menus

Voice menus can be linked so that one voice command, such as Graph, will automatically load the next set of choices, such as Pie, Bar or Line.

The Voicecommand system includes a half-size add-on board, software, a microphone and an instruction manual.

It is available now to run on the IBM PC, Personal Computer XT and AT and requires 64K bytes of main memory.

Net managers introduced

From page 19

Engarde's ability to uncover network problems quickly is important since "every minute of downtime costs the bank money," Scroggs said. He added that the windowing feature is particularly helpful in network monitoring.

Engarde's starting price is $70,000 to $85,000, depending on the customer configuration. The product is available 90 days after order, according to Doelz.

Although an entry-level system, the Case Communications 5110 network management system provides many of the same functions as the larger Case 5000 series and can be expanded as a data communications network grows, according to Reyan Carpenter, marketing manager for the Columbia, Md., company.

Based on a Convergent Technologies, Inc. 32-bit minicomputer, each 5110 can manage a network consisting of up to 30 leased telephone lines equipped with Case 4000 series modems or up to three Case DCX 840/850 communications processors, according to the company.

The 5110 processor runs the Unix operating system, the Unify relational data base manager and system management software written in the C language.

The system costs $15,995 and will be available for delivery Sept. 1.

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INGRES. The Distributed SQL Relational DBMS.

MICROCOMPUTERS

SMALL TALK
Maura McEnaney

CD-ROM all sizzle, no steak

Last March, I started a file of clippings on compact disk/read-only memory (CD-ROM) technology. Little did I know that I had created a monster.

In four months, the CD-ROM file has grown to be the largest in my filing cabinet. Right now, it weighs in at seven pounds and takes up three inches of drawer space. I'm now thinking of building the file a home of its own.

Every time I run across that monstrous file, I can't help but ask two questions: Is CD-ROM technology really that hot? If so, why isn't there more of it out there?

Maybe we should blame the CD-ROM information overload on the computer slump. "Editors are looking for new technology, and right now, it's CD-ROM," a colleague told me recently.

It's true that the shiny compact disks have a storage capacity of 0.5G bytes and are virtually indestructable, making the write-once technology ideal for storing large, unerasable data bases.

But like a rookie who receives too much press before he's hit his first home run, CD-ROM applications are still in their infancy.

Granted, the young industry took some major strides this summer when the High Sierra Group, an ad hoc group of 13 vendors, proposed a set of standards [CW, June 23] that would permit CD-ROM disks to run across multiple operating systems. And companies designed to help both users and software developers come up with CD-ROM applications are springing up here and there.

At a recent Information Industry Association conference on CD-ROM technology, Lotus Development Corp. Vice-President Don McLagan told attendees that the success of CD-ROM will depend

See CD-ROM page 28

McEnaney is a Computerworld *West Coast correspondent.*

Group tackles productivity

Pacesetter product gauges 'intangible' contributions

By Douglas Barney

PRINCETON, N.J. — A consortium consisting of 12 corporations and a variety of U.S. government agencies teamed up with Pacesetter Software, Inc. to develop Productivity Map, a software product that measures white-collar productivity.

"I was looking for a way to break through the barrier in measuring white-collar productivity. White-collar people say their jobs are not measurable, that they are intangible. I thought anything worth doing was worth measuring," said Greg Whitney, manager of organization analysis for 3M Corp. in St. Paul, Minn.

3M, a member of the consortium, will use the $695 Productivity Map to assist department-level managers in identifying what productivity is, identifying critical areas affecting productivity that need to be addressed by the manager and tracking actual performance, Whitney said.

According to Whitney, Productivity Map forms a new category of software. "It is the first and only one that I know of. We haven't seen anything else on the marketplace," he said.

The major difference between Productivity Map and project management software is that Productivity Map focuses on satisfying the customer's requirements, Whitney said. Project management software, however, is aimed largely at managing project schedules and expenses.

The program is interactive and asks the user a variety of questions to clarify the organization's objectives, examine internal activities, identify key customers and understand their objectives and select an appropriate performance measurement for their department.

With graphics and data management facilities, managers can track their department's progress.

The product runs on IBM Personal Computers and compatibles with a minimum of 256K bytes of random-access memory.

T/Maker will market Next's Apple software

By Douglas Barney

PALO ALTO, Calif. — Next, Inc. has licensed T/Maker Co. to market its $175 Writenow word processing package for Apple Computer, Inc.'s Macintosh. T/Maker Co. will ship the product in October.

Next, which acquired the package through the purchase of Solaster, Inc. earlier this year, was founded by former Apple Chairman Steven Jobs to develop high-end products for the academic market. "We bought a small company from Seattle called Solaster. We acquired them specifically because we wanted to acquire the programmers," said Dan'l Lewin, manager of sales and marketing for Next. "We are not in the business of selling Mac software."

T/Maker, on the other hand, is in the business of selling Macintosh software. "There is a need for an easy-to-use word processor, but with very powerful capabil-

See T/MAKER page 26

IBM expands maintenance list

By David Bright

IBM announced recently that it will provide maintenance service for 33 additional non-IBM products and introduced a memory expansion board and two modems. In addition, IBM introduced a 70M-byte fixed disk drive for the RT Personal Computer.

The additional non-IBM products brings the total oumber of non-IBM, PC-related products supported to 83. In June, Big Blue took a similiar step and added support for 17 oon-IBM products.

IBM increased its support offerings "as a convenience to our customers to broaden the range of IBM support available to them," said spokeswoman Dale Bennett. The support offerings were part of a series of announcements earlier this month.

The newly supported products include peripherals and add-on boards from four vendors: Amdek Corp., Hayes Microcomputer Products, Inc., Hewlett-Packard Co. and AST Research, Inc. The majority of the items are various AST add-on boards. Depending on the type of service ehosen, annual minimum maintenance charges range

See IBM page 26

INSIDE

NEW THIS WEEK

- Toshiba America upgrades its IBM-compatible portable PC

For more on this and other new products, see pp. 75-85.

INSTANT ANALYSIS

"The issue in the future is not integrating micros into the world of minicomputers and mainframes, but how do minis and mainframes justify their existence."

— William Zachman, International Data Corp. corporate vice-president of research at Software Publishing Corp.'s introduction of its improved PFS: line

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Lotus contract with RSA Data Security in works

By Peggy Watt

CAMBRIDGE, Mass. — Lotus Development Corp. is expected this week to announce that it has licensed RSA Data Security, Inc. of San Carlos, Calif., to develop an encryption system for a new Lotus product.

Lotus and RSA would not disclose details of the system, but RSA specializes in data security for network transmission. The company has done similar development work with other companies involving the protection of data communications files. RSA has a license for encryption system development with the U.S. Navy.

Lotus was unavailable for comment at press time.

The system RSA will develop for Lotus will be based on the RSA standard algorithm, which allows the user to check for file authenticity and verify the author of an encrypted program through a binary number generation program, according to an RSA spokeswoman.

The Data Encryption Standard is part of the RSA standard but includes additional verification features, she said.

The spokeswoman said the contract is a multiyear agreement and may eventually involve more than one Lotus product.

RSA's encryption method creates a digital seal, or signature code, that can be decrypted by a public key, or binary numerical password.

IBM adds products

From page 23

from $30 to $275.

If a PC system carries an IBM warranty option or maintenance agreement, all of its add-on boards not under original warranty must be included in an IBM maintenance agreement, IBM said.

For customer carry-in repair, the maintenance charge for the Amdek 310-A monochrome display is $30. Annual maintenance fees for the Hayes Transet 1000 multifunction buffer begin at $65. The on-site exchange fee for HP's 7550A color graphics plotter is $275.

AST cards supported include I/O Plus II, Preview, Rampage, Rampage-AT, Ramvantage and Fourport. Annual fees for these boards are between $35 and $110.

Memory on the multifunction Memory Expansion Adapter ranges from 512K bytes to 3M bytes. Prices start at $595; each additional 512K-byte module costs $165.

The board includes a parallel printer port and an asynchronous serial communications port.

Both modems operate at 2,400 bit/sec. and support full-duplex mode. The standalone 5842 modem is priced at $719. The 4829 half-length, 2,400 bit/sec. modem card is priced at $569.

The 70M-byte ESDI Fixed-Disk Drive and Magnetic Media Adapter for the IBM RT PC support the proposed Enhanced Small Device Interface standard. The new drive replaces the previously announced 70M-byte Fixed-Disk Drive and carries a price of $3,995; the adapter is priced at $650.

The expansion board and modems should be available this month. Scheduled availability for the RT PC disk drive and controller is Sept. 26.

T/Maker to market tools

From page 23

ities, like Microsoft Corp.'s Word. We have automatic footnotes, a variety of headers and footers, a 50,000-word spell checker and unlimited windows. We have word processing that is as easy to use as Macwrite but is much faster than Microsoft's Word," said Royal P. Farros, T/Maker's vice-president of sales and marketing.

Next has not yet brought any product to market. Its scholarly workstation will not be offered until at least next year, Lewin said.

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Source: Tony Liberoni, Manager of Operations and Systems, PPG Industries Chemical Group

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Source: Luther Perry, D.P. Director, Santa Cruz County, CA

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"MANTIS is the international on-line application development standard for General Foods."
Source: Fred Lambrou, International Director of Information Services, General Foods International

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The Choice does legwork in software decision

By David Bright

BETHESDA, Md. — Maple Systems International now has a program that aids in the evaluation of software packages. Called The Choice, the $100 package is targeted at managers and consultants involved in choosing applications for systems ranging from personal computers to mainframes.

Twelve templates are separately available for evaluating the following types of applications: accounts payable, accounts receivable, data base management systems, capital projects, general ledger, word processing, payroll, personnel, purchase order, fixed assets, financial modeling and fourth-generation languages. The templates cost from $25 to $50. Users can also create their own evaluation templates.

The templates will save managers time and effort. "We are doing the laborious and tedious homework of poring over user manuals, company brochures and industry reports to determine what is the state of the art in each of these applications," said Jim Cooper, president of the start-up company. "Users of The Choice can eliminate this research and use the template as a base on which to develop their own evaluations."

Although the software does not contain information about specific vendors' packages, it allows the user to compare a package's features with a list of as many as 500 features crucial to a particular type of application. The average mainframe application has between 50 and 250 requirements to be checked, and the typical microcomputer application has fewer than 50 requirements, Cooper said. Each feature is accompanied by a 100-word description.

For each type of application, the user weights and scores up to seven vendor packages; The Choice then summarizes and ranks each package. It can calculate and rank 450 requirements for seven vendor packages in less than 1 sec. The Choice requires an IBM Personal Computer or compatible with 256K bytes of memory and two floppy disk drives.

Grid releases LAN E-mail

By Peggy Watt

MOUNTAIN VIEW, Calif. — Grid Systems Corp. last week announced Field Mail, an electronic mail system for use on a local-area network or for remote access by users with laptop computers in the field.

The Field Mail package runs on the Grid Server, providing a maximum of 164 mailboxes for sending or receiving messages, according to a Grid spokesman. The Field Mail software package costs $3,125.

The corresponding software for each participating remote or local terminal is $75, and it runs on a Gridcase laptop system and IBM Personal Computer or compatible desktop computers. It is available immediately.

With the system, a user can assign a priority to each message sent, similar to postal service designations. First class calls for immediate delivery; second class, for delivery when a second message is sent to the same person. Third class ensures delivery upon availability of the server. Third-class mail may also be sent at off-peak times when one is using a time-sharing system or standard telephone lines linking servers.

The user can also send the same message to multiple recipients and set standing distribution lists. The Field Mail application is available immediately.

As many as 30 servers can be linked and electronic mail can be sent among them. The number of messages stored is limited only by server storage, which ranges from 10M bytes to 40M bytes.

The server is priced at $12,950 for a system with 10M bytes of storage and $15,300 for 40M bytes of storage.

CD-ROM all sizzle, no steak

From page 23

on its ability to clear several major hurdles, the first of which is the price of the hardware.

In its current form, CD-ROM is too expensive, McLagan pointed out. The compact disk readers that are needed to access a CD-ROM data base now cost about $2,250. As a result, many vendors are bundling the cost of the CD-ROM readers with their individual data bases.

Vendors are taking a hard-sell approach to CD-ROM, McLagan said. "We must make it immediately apparent to the end user what the capabilities of CD-ROM are," he added.

But exactly who that end-user will be remains to be seen. Will the responsibility for CD-ROM players fall under the jurisdiction of MIS managers, whose purchasing responsibilities have in some cases widened to include even telephones? Or will CD-ROM fall under the jurisdiction of the Information Center?

Unless some of those questions are answered, the seven-pound file I've started will grow heavier with more stories that only ponder the practicality of CD-ROM.

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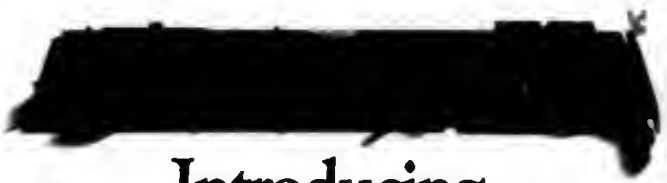

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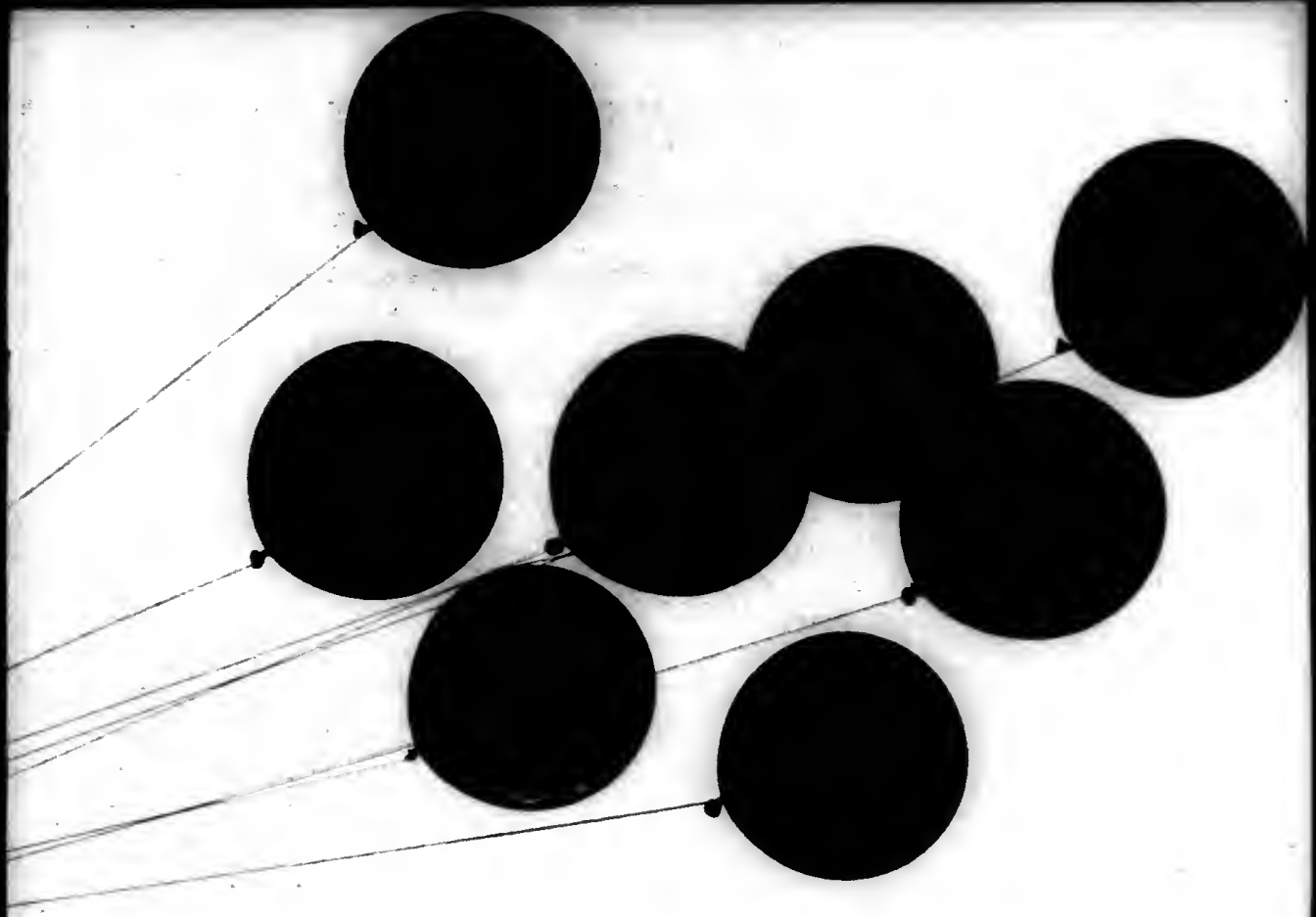

meridian SL-1

NETWORKING

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SOFTLINE
Jim Highsmith

Soft harmony depends on trio

At a recent software engineering technology conference, Tom DeMarco (of structured-analysis fame) was asked what we have learned in the past 10 years about developing software. His response was that, even after a decade, what we have learned has not helped much because most people are asleep anyway. New technology is more or less irrelevant, DeMarco concluded. What we require is a new sociology.

From Jerry Weinberg at the same conference: "We already know far more than enough to double productivity — except how to look at ourselves, and we'll do anything to avoid that."

It is instructive that DeMarco, credited with popularizing a new analysis method and tool (data flow diagrams) and Weinberg, a respected author and consultant in systems development, are more concerned with the people problems of increasing productivity than with the technology.

In the last five years, powerful new software development technologies have reached the market. The potential improvements are far too great for any competitive organization to ignore. But how do we reach that potential?

This article addresses three factors critical to improving software development productivity — people, methods and tools — and makes the following recommendations:

• Concentrate on people issues and the installation of adequate organiza-

See **SOFT** page 34

Highsmith is a principal of Information Architects, an Atlanta-based consulting company.

From genesis, expert system shells subject to evolution

By Charles Babcock

PHILADELPHIA — When a group of Stanford University researchers in the early 1970s removed the medical knowledge from the expert diagnostic system Mycin, they renamed it Emycin, or empty Mycin, as a joke.

What remained, however, was the inference engine with a skeleton knowledge base, and what they had created was one of the first expert system shells. Since then, Emycin, with the addition of new rules and information, has propagated three more machines: Puff, an expert system for diagnosing respiratory diseases; Dart, an expert system for locating failures in telecommunications systems; and Guidon, an expert system for teaching medical students, according to Frederick Hayes-Roth, chief scientist and vice-president of research and advanced development at Teknowledge, Inc., an expert system shell builder in Palo Alto, Calif.

With an expert system shell, software developers have the equivalent of a fourth-generation language or application generator for use in the field of artificial intelligence, Hayes-Roth says. But, he warns, developing expert systems remains more an art than a science.

Hayes-Roth helped to develop the M.1 microcomputer and S.1 minicomputer expert system shells at Teknowledge. He served as an opening day speaker at a tutorial session on expert systems at the American Association for Artificial Intelligence conference last week.

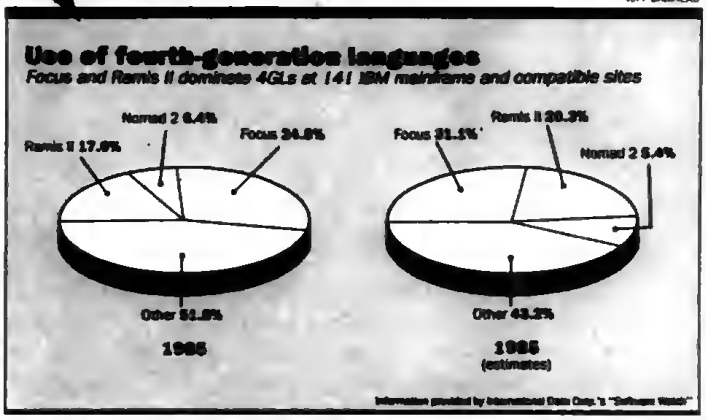
System shells are created by generalizing the basic skeleton of an existing expert system into something that can be used for a variety of applications, he explained.

Shells are good for one problem-solving process. Emycin, for example, was a forward-chaining process in which if-then rules acting on additional information helped move the system closer to identifying the disease. Other shells are backward-chaining devices. These types of shells break a problem down into its constituent

See **EXPERT** page 35

DATA VIEW

JEFF BARINEAU



INSIDE

NEW THIS WEEK

- Autodesk upgrades Autocad
- Cosmic offers computer-aided design program

For more on these and other new products, see pp. 75-85.

INSTANT ANALYSIS

"We are impressed with MSA's second-quarter results [revenue of $47.6 million, up 25%] and are encouraged by the stability of U.S. demand throughout the first half of 1986 and by the enormous strength of international revenues."

— **Prudential-Bache Securities July 24 research report on Management Science America, Inc.**

Soft harmony relies on trio

From page 33

tional change mechanisms.

• Focus on design methodologies.

• Leverage productivity by concentrating on analysis and design support tools.

First, the fact that programming productivity is not a technological problem must be accepted. In some companies, every methodology, project management system, software tool and gadget ever produced has been purchased at some point in the last 10 years — with little positive result.

But in one of the most productive development groups at a $4 billion company, there are long lists of all the "tools" they do not have — including a data base management system. Their average time to deliver major systems is six to eight months. Programmers produce three to five fully tested CICS programs per day.

What makes the difference? There are many answers to the question: long-term, foward-thinking management; commitment to full hardware and software support for all phases of development; and a 10-year investment in good, design-oriented development methodologies.

Introduction mechanism

The key element missing in many other companies seems to be a successful mechanism for introducing new products into the development environment.

Part of the problem has been the failure to differentiate between design and project management. While project management deals with tasks, scheduling, reporting and quality assurance, design deals with the how-to issues of analysis, data base design and structured programming.

Systems development organizations must begin to recognize the need for better techniques for tasks such as requirements definition, data base design, systems architecture design and programming. If the names Codd, Jackson, Orr, DeMarco, Yourdan, Gane, Constantine and Warnier, to name a few, are not being discussed in your organization, maybe it is time to refocus on design methodologies that help the staff learn to do the task more effectively.

Tools are the third leg of the productivity triangle. There are two types: logical tools, such as data flow diagrams or entity diagrams, help the communications process (graphics, structure diagrams and decision tables), and physical tools, such as Designaid from Nastec Corp. (hardware/software), enable easy construction and modification of those communications mediums.

Newer software tools can even assist algorithmic processes, that is, automate the methods in addition to the documentation.

With a growing number of tools available, where should the emphasis be placed? T. Capers Jones, a respected author and lecturer on programming productivity, has gathered statistics showing program coding is only about 10% of the cost of large projects, whereas defect removal, at over 40%, is the largest expense.

Other authors have stated the cost difference between discovering a defect in programming and analysis is $100 to $1. Yet most efforts over the last 10 years have been directed toward programming tools. Given this data, it appears the emphasis should increasingly be on tools to support the front end of the development life cycle (requirements and design).

New tools to support analysis and design are beginning to emerge. The potential for computer-aided software engineering (CASE) workstations is enormous. These tools are just beginning to make an impact in leading-edge companies.

Reaching higher levels of software development productivity is not easy. Just as we cannot expect a nonengineer to design an automobile — even with a sophisticated computer-aided design and manufacturing system — we cannot expect analysts and programmers to use CASE technology without adequate software engineering knowledge.

Only by bringing an integrated, well-disciplined approach to people, methods and tools will the full software development productivity potential be reached.

Expert system shells evolve

From page 34

parts and solve them separately.

In addition, Hayes-Roth said, shells use "hill climbing," a technique in which the distance to a goal is estimated to order the choices in a search of the most promising possibilities.

These are considered "weak methods" in constructing expert systems, meaning they are not specific to the task in the way that separately engineered hardware and software might be.

Knowledge engineers, or people who try to capture the insight of a human expert in a computer system, have recognized a number of problems with an expert system like Emycin.

The systems are not integrated into the environment for which they were designed. They have a static view of time, which makes it difficult for them to deal with problems that unfold during a long period, and they have a lot of built-in assumptions that do not apply when used on a new class of problems, Hayes-Roth said.

However, researchers at Stanford, in working with Emycin, have come up with Oncocin, a cancer-therapy prescribing system.

According to Hayes-Roth, it is closely integrated with the record-keeping in which doctors typically engage, it offers output in the form of graphs, it can back up and explore previous treatments that may be affecting the patient and it can suggest a current therapy for treatment.

Another shell that is not confined to the research laboratories is Salt, a hill-climbing shell from Carnegie-Mellon University that has been used to produce an expert system to configure elevators, schedule their construction and tell a repairman how to fix them after they are installed in a building, Hayes-Roth said.

"Salt is able to presuppose constraints. It knows problems are interrelated and cannot be checked in isolation," he noted.

The rapid development of expert systems, according to Hayes-Roth, will result in "more effective shells evolving over time, tailored to more specific applications."

Pick group sets norm

SAN DIEGO — The Spectrum Manufacturers Association (SMA), a collection of 17 vendors that use the Pick operating system from Pick Systems, has recently released drafts of standards for magnetic media interchange and the Basic language.

Last fall, the association designated an SMA standard for data base management systems running on member hardware. SMA's goal is to provide technical standards that will maintain base-level compatibility among products as they are developed.

The association is composed of domestic and foreign companies, two of which are Prime Computer, Inc. and Pick Systems.

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2

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3

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4

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Quick Start is the entry point, from which you can succeed in expert systems on any scale.

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SYSTEMS & PERIPHERALS

HARD TALK
Donna Raimondi

Drumming up summer news

These are the dog days of summer — that sunny, steamy time of year when even busy MIS managers want to slip on their designer shades and put their moccasin-clad feet up on a porch railing — preferably located on an island somewhere.

While that urge to escape is hitting the work force, veodors seem immune to it. For the past few weeks, strange messages and phone calls from vendors have streamed into *Computerworld*'s editorial offices. All of a sudden, vendors have decided to get chatty about their companies' progress since last we met. No new products right now, these messages say, but here is what we've been up to for the last year.

It is sort of a hot-weather public relations version of Aunt Millie's Christmas card missive, in which she relates that cousin Herman broke his toe in February and Aunt Philippina finally divorced oasty Uncle Henry last spring.

Amdahl Corp., for instance, called a press conference, in part to say it has discovered that its 5890 Model 300 dual processor, announced last October, actually outperforms the company's previous measurements. Instead of being 1.7 to 1.9 times more powerful than Amdahl's 5870 dual processor, the Model 300 reportedly is actually 1.8 to 2.1 times more powerful than the 5870.

Also, a note from Alliant Computer Systems Corp. President Ron Gruner says that the minisupercomputer vendor has had three successive quarters of profitability in what has been a tepid

See **DRUMMING** page 38

Raimondi is a Computerworld *senior writer.*

Southland tests Amdahl

Early user reports 5890 matches vendor's claims

By Jeffry Beeler

SUNNYVALE, Calif. — The world's largest coovenience store chain recently became the first corporation to identify itself publicly as an early user of Amdahl Corp.'s newly available IBM 3090 class of mainframes.

Word that Dallas-based Southland Corp., with an annual revenue of $12.8 billion, ranks among the first six buyers of Amdahl's 5890 Model 300 coincided with the hardware vendor's claim that the processor exceeds its initial performance estimates by about 10%.

In doing its own testing during the past two months, Southland found that, at least in a batch environment, the 5890 Model 300 performed as well as Amdahl claims. Southland plans to move on-line applications to the Model 300 next month.

Disclosure of the early user installations and of the greater-than-expected Model 300 throughput came at Amdahl headquarters in Sunnyvale during a recent press conference that featured prepared remarks by Southland's MIS Vice-President David Karney.

Southland, which owns the 7,800-store 7-Eleven and 450-outlet Chief Auto Parts chains, installed its 5890 Model 300 on June 28 to create an upgrade path for its existing Amdahl 5860, which was fast reaching capacity level. The acquisition also promises to enable the firm to maximize the speed of the 1.2 million on-line IBM CICS transactions it processes each day, Karney said.

Prior to installing its latest mainframe, Southland ran its real-time CICS applications on an IBM 3090 Model 200 and divided its batch jobs between the 3090 and the 5860, which competes with IBM's older

See **SOUTHLAND** page 38

CDC says Map V array processor boosts Cyber/180 performance

By James Connolly

MINNEAPOLIS — Mainframe manufacturer Control Data Corp. has introduced an attached 32-bit array processor designed to increase the performance of its Cyber/180 line of superminicomputers and mainframes in computation-intensive applications such as simulation and seismic image and signal processing.

According to the vendor, the Map V performs up to 100 million floating-point operations per second with I/O transfer rates of up to 100M byte/sec. The processor, which attaches to the Cyber/180 midrange Models 840A, 850A, 860A and 870A and the high-end 990E and 995E, was designed to let customers achieve near-supercomputer performance at a fraction of the cost of a supercomputer, according to Martin Ferrante, CDC marketing manager for array and parallel processing systems.

Ferrante said the Map V can be used to accelerate a variety of simulation and signal and image processing applications for seismic processing in petroleum exploration, medical imaging, speech analysis, radar and sonar analysis, aircraft simulations, filtering, molecular modeling, matrix manipulations and fast-Fourier transforms.

The I/O interface can reportedly transport data and applications at up to 100M byte/sec., compared with the 1M to 3M byte/sec. rates for competitive systems, according to CDC officials. The vendor claims the increased speed will eliminate the I/O bottleneck that in the past has limited the effectiveness of array processors.

The Map V combines parallel, pipelined multiple processors in an architecture supporting multiple application processing and supports multiple host connections in a mixed-vendor environment, according to a CDC spokesman.

The company said it is offering a 32-bit

See **MAP** page 40

INSIDE

NEW THIS WEEK

- Genicom unveils 3410 Quiet printer
- Displex offers uninterruptible power supply

For more on these and other new products, see pp. 75-85.

INSTANT ANALYSIS

"IBM says you can't have one architecture up and down the product line. DEC is doing its best to prove that assumption is wrong."

— John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass.

Floating Point strives to bring supercomputing into office

Announces minisupers, entry-level processor

By James Connolly

BEAVERTON, Ore. — Floating Point Systems, Inc. last week announced two minisupercomputers that it says will move supercomputing capabilities from the computer room into an office environment.

In addition to introducing what it termed independent or stand-alone minisupercomputers named Superserver and Superstation, Floating Point also announced an entry-level version of its attached scientific processor and renamed its other attached processors.

Although intended for use at the departmental level, the Superstation, Superserver and entry-level M64/10 remain targeted at the engineering and scientific markets.

Floating Point's existing scientific computers, previously known as the FPS-364, FPS-264 and FPS-264/20, were renamed the M64/40, M64/50 and M64/60, respectively.

Company officials said the MAX series application accelerators have been renamed the M64/140 and M64/145. In addition, the company said the Superserver and Superstation will be available as attached processors under the names M64-20 and M64-30, respectively.

The Superstation is available in two configurations, each of which includes a Digital Equipment Corp. Vaxstation II/GPX and from 8M to 32M bytes of memory.

The basic configuration is the M64/320 Superstation, which Floating Point officials said can perform 6 million floating-point operations per second (MFLOPS). It costs $187,000.

Uses surface-mount boards

The high-end Superstation, the M64/330, reportedly performs 12 MFLOPS and costs $275,000. The Superstation uses surface-mount boards and, like the other products announced last week, runs Floating Point's SJE operating system. The M64/320 can be field upgraded to the M64/330.

"Our M64 series users have access to one of the most comprehensive libraries of supercomputing math routines and third-party applications software in the industry. . With the Superstation and Soperserver, we are extending supercomputing capability from the computer room environment into the office," said John M. Harte, Floating Point's vice-president for marketing.

He added, "These new independent engines and the new entry-level M64/10 will provide the competitive edge necessary to increase our market share and create the awareness that supercomputing is oow reality at the departmental level.

The M64/220 Superserver and the M64/230 Superserver are network computer servers that include Sun Microsystems, Inc. Sun 3/50 workstations. They feature an Ethernet interface with the Transmission Con-

See **FLOATING** page 40

Drumming up summer news

From page 37

period at best for many other computer companies. The note also relates that marketing and sales efforts have been aggressively expanded both at home and internationally (more than 15 new sales offices); that more than 20 application packages are now available on the FX/1 and FX/8 computers; and that it has now installed 32 customer systems.

Wang Laboratories, Inc. decided to send along a package of all the press releases it has cut from newspapers and magazines over a three-month period. News from Stouffville, Ontario's *Stouffville Sun* of a triathalon winner in a Wang-sponsored race competes with *The Vancouver Province*'s report of a Wang-sponsored $21 million computer research and development start-up in Victoria, B.C.

Digital Equipment Corp. founder and President Ken Olsen decided to wait for the summer doldrums to announce that businesses have to completely rethink the way they operate. He expounded on a concept in which all company departments will do business in a standardized way. His vision of this new business method sounds very much like the way he claims compatible DEC VAX computer systems work.

From DEC's press relations folks recently came a message that *Computerworld*'s DEC history chart, showing the evolution of DEC machines, was wrong. The chart was printed in an October 1985 issue.

IBM called in to say it liked the article on its RP3 parallel processing project [CW, July 28] except for one line about the fact that Big Blue does not always use the latest technology in some of its research projects. The irony is that the line in question is a quote from one of IBM's own personnel.

And Mitchell Associates, Inc. President Mitch Modeleski, who, despite Prime Computer, Inc.'s objections, ran a third-party vendor exhibition at the MGM Grand Hotel in Reno, Nev., concurrently with the 1986 National Prime User Group (NPUG), also wrote. He sent copies of several letters that went back and forth among him, NPUG President Patricia Craig and the MGM Grand questioning just who is entitled to show up at the site of NPUG meetings.

In a statement that looked like a bald attempt to control Craig, Modeleski wrote to her, "Let us view Prime's latest threat [to pull out of NPUG if the third-party vendors are allowed to exhibit concurrently] for what it is — a bald attempt to control Patricia Craig. . . ."

These bits and pieces are just some of the many keep-in-touch messages received here this summer. Perhaps *Computerworld* should repay in kind, with tales of exciting summer newsroom activities. We could start with the time rain dampened the company picnic.

Wang graphics terminal bows

Advent ups support for VS superminis

By James Connolly

LOWELL, Mass. — Wang Laboratories, Inc. last week announced a color graphics terminal for use with its VS series of superminicomputers.

The Advent terminal reportedly provides improved support for high-resolotion graphics in conjunction with traditional Wang information management software, graphics applications, integrated data base and spreadsheet packages, including Wang Office, Wang's VS Graphics Facility and Wang 20/20 TM.

Wang officials also said the terminal supports specialized third-party applications for VS systems, such as mapping, project management and decision support packages.

The terminal includes a 19-in. color monitor, an electronics control unit with a 16-bit Intel Corp. 8086 microprocessor and a three-button mouse device for graphics cursor management. The monitor was designed to provide 1,280 by 1,024 pixel bit-mapped display with 100 pixel/in. resolution. It can display up to 32 colors simultaneously from a palette of 4,096 colors. The terminal also supports multiple-screen windows that display information in several formats.

The company said graphics output can be printed on Wang's LIS-12 and LIS-24 laser printers and the Wang 5577 matrix printer.

The terminal will be available in October and costs $13,900.

Southland tests Amdahl 5890

From page 37

3081 Model K mainframe. But by early this year, "We had reached a point in our natural growth where we had begun to exhaust our 5860's capacity," Karney said.

"Our requirements for systems resources are growing 40% to 50% per year, partly because of our high-level language development activities," Karney said, citing the inefficiency of those high-level languages.

To ease its resource constraints, Southland recently decided to replace its 5860 with a faster alternative. At first, the user organization considered procuring a second 3090 Model 200 but eventually rejected the option for price/performance reasons. Amdahl claims that the 5890 Model 300 provides about 30% more internal throughput than comparably priced IBM systems, such as the 3090 Model 200.

Nor did Southland cast its lot with IBM's still-unshipped 3090 Model 400, which the retailer would have been unable to install quickly enough for the retail chain to avoid overloading its 5860, Karney said.

For a while, Southland considered replacing its 5860 with an Amdahl 5880 but ultimately nixed that idea, too. Although the multiprocessor 5880 outperforms the uniprocessor 5860 by a wide margin, the larger machine would have provided only enough additional computing power to tide over the company until next year, Karney said. By then, the firm would have been due for another systems upgrade.

In the end, Southland narrowed its field of mainframe prospects to the Model 300, which is expected to satisfy the user organization's resource needs through the middle of 1988. Acquisition of the new CPU also will postpone by several months the expected degradation of the firm's response times, which currently range from three and five seconds, as the business grows, Karney said.

Although Southland was once an early user of Amdahl's 4705 communications processor, the installation of the Model 300 marks the first time that the company has consented to become a guinea pig for an untried general-purpose mainframe.

"Participation in Amdahl's early-release program definitely raised concerns for us," Karney said. "I knew the criticism I'd hear if the machine fell short of expectations would be much greater than the praise I'd get for putting us on the leading edge of technology."

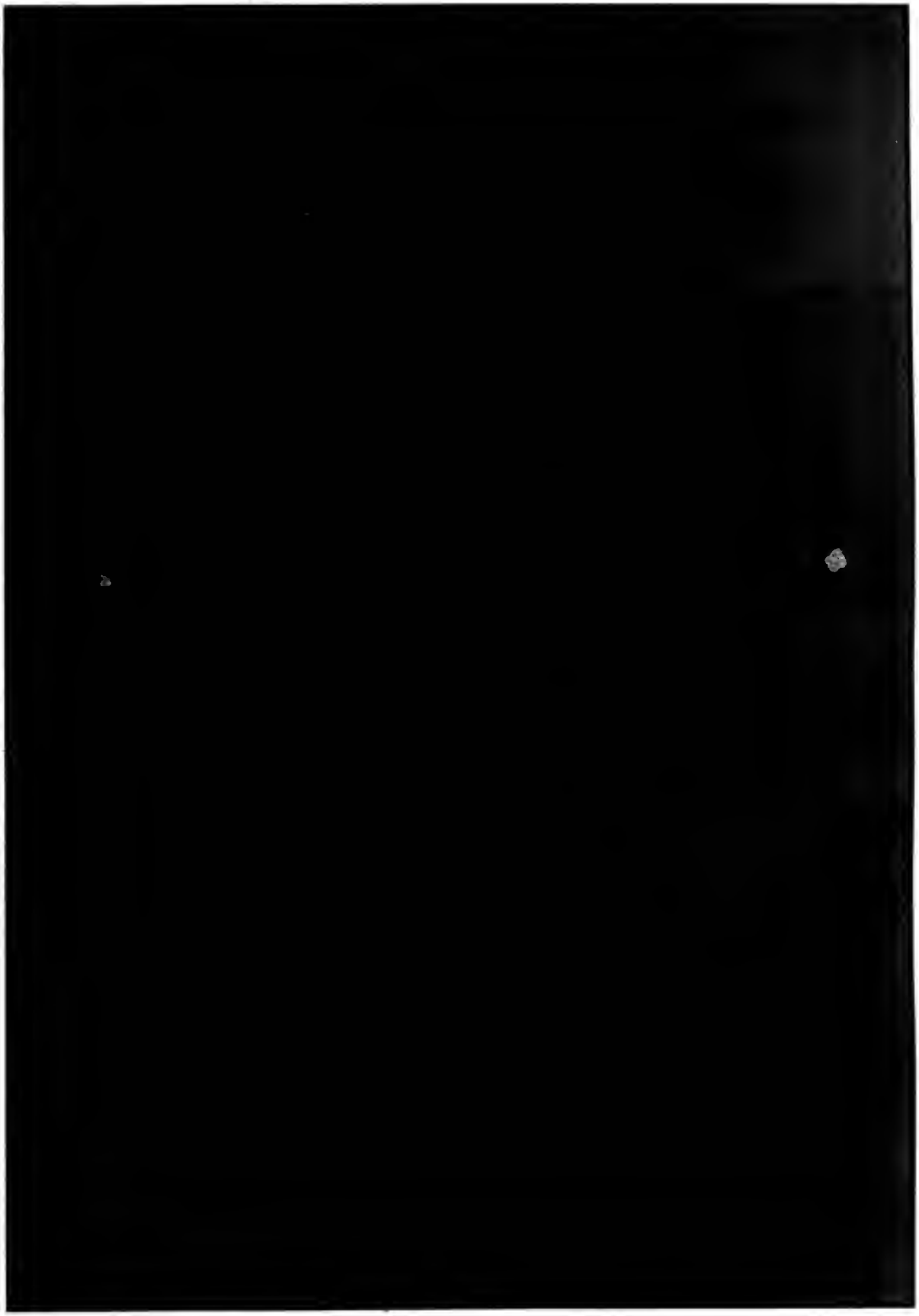
But despite the potential risks, Southland proceeded with the 5890 Model 300 installation, partly because it was heartened by the results of Amdahl's own internal use of the machine. Since late May, a 256M-byte Model 300 in the vendor's Corporate Computer Services (CCS) department has performed IBM MVS/XA production jobs without a system failure and has supplanted three existing 5860s, according to CCS director Cindy Johnson.

A second 5890 has also executed simulated production applications in Amdahl's Performance Evaluation Center (Ampec), where the machine was 80% to 90% faster in MVS/XA batch tasks than the company's dual-processor 5870. The observed throughput edge is even greater than the 70% to 80% advantage that the veodor quoted when it announced the product last October, according to Amdahl Chief Operating Officer Joseph Zemke.

In IBM Information Management Systems environments, the 5890 Model 300 outperforms the 5870 by 100% to 110%, compared with a predicted superiority of only 80% to 90%, Zemke added. The performance figures that emerged recently from Ampec jibe well with the numbers that Southland has collected independently, Karney said.

During the past seven weeks or so, the retailer has moved all the batch applications that previously resided on its 5860 over to the 5890 Model 300, which provides three times more power than the older CPU. At the same time, Southland has also equipped the Model 300 with Amdahl's Multiple Domain Feature (MDF), which permits two or more operating systems, either similar or dissimilar, to coexist in the same box.

In September, Southland intends to activate its MDF, which will create inside the MVS/XA-based 5890 a logically discrete region for the maintenance of the company's systems software, he added.



Telex launches terminal system for the airline industry

By James Connolly

TULSA, Okla. — Expanding upon the capabilities of its earlier terminal line, Telex Computer Products, Inc. has announced a series of products developed specifically for the airline industry.

The Airline Systems Automation products reportedly are compatible with the existing Telex 1000 and Telex 4000 terminal systems and are the company's first internally developed terminal offerings for airlines. The products include two IBM 3270-compatible display stations, a control unit and a selection of intelligent workstation configurations.

The display stations are the 078-A and the 080-A terminals, which the company said are designed to fit in the limited space of an airline ticket counter or reservations office. They include the choice of either green or amber monochrome monitors. The 078A has a 12-in. display with split-screen capability and costs $1,700. The 080-A features a 15-in. display with quad-screen partitioning and costs $2,750. Both are available with either Airline Link Control or 3270 keyboards.

The 070-A control unit reportedly is compatible with Telex's 1070/1076 controller and was designed to support cluster configurations of up to 32 terminals on a single coaxial cable of up to 5,000 ft under various protocols. It costs $3,400.

The Intelligent System Series is based on Telex's 1280 Intelligent Workstation, which is compatible with the IBM Personal Computer AT and was designed to connect through an Airline Device Feature (ADF) or Airline Controller Feature (ACF) to airline host systems. The ACF costs $1,500, and the ADF costs $1,200.

Floating Point minisupers

From page 37

trol Protocol and Internet Protocol and Sun's Network File System.

The M64/220 provides 6 MFLOPS of peak performance and the M64/230 is rated at 12 MFLOPS, according to the company.

Like the Superstation models, the Superservers are available with 8M bytes to 32M bytes of memory and can be field upgraded from the basic model to the high-end model.

The M64/10 was designed to be a front-end-compatible minisupercomputer delivering 6 MFLOPS of power for less than $100,000.

The M64/10 is available with 8M bytes of memory, a 170M-byte disk drive and a software package that includes Fortran and SJE as well as Floating Point's Program Development Software without attendant math libraries.

According to a company spokesman, it can be upgraded to other M64 series models as user needs increase.

Floating Point announced its first 64-bit attached minisupercomputers in 1981. Company officials claimed that peak performance ranges in the M64 series now reach 341 MFLOPS at prices ranging to more than $1 million.

Map V boosts Cyber/180

From page 37

array processor rather than a 64-bit processor because the simulations and processing problems at which the Map V is targeted do not typically require 64-bit processing.

However, CDC said it expects the typical Map V customer to be a large, sophisticated organization that needs a turnkey solution or products that allow for rapid development and processing of proprietary codes.

Executive Roundtable

Beneficial Data Processing's Luciano Corea Jr.

Transamerica Financial Services' Arnold Danberg

Quaker Oats' Ronald Brzezinski

Georgia Power's Grady Baker

End-user computing

MIS answers the call

The news will come as a shock to few MIS managers: Computing power is increasingly being taken in hand by end users. From all indications, they like what they've got and are eager for more.

Recently, Computerworld *invited four MIS executives to discuss end-user computing — its form in and impact on their companies.*

In the discussion, moderated by Senior Editor Glenn Rifkin, it became clear that MIS is willingly taking great steps to provide computer power across the desktops of American workers. But technological and managerial challenges still abound.

How do you define end-user computing in your organization?

Danberg: I would define end-user computing as an environment in which the user has free control and latitude over the process. He may use data which is interchanged through the mainframe or the MIS division, or he may create his own data. But he's in control, he's responsible for the product and the effectiveness of the use of the equipment.

Baker: We define end-user computing as information systems as opposed to foundation systems: The user is totally in control of what's done and what's used. And the MIS function is a support function to the client, and we call them clients.

Corea: We consider end-user computing to be computing that occurs outside the MIS arena. In essence, we provide them support. They are in control of their data, and we've come 180 degrees from the days when DP was driving computer use. They are now giving us the direction — what they need, what they want. And they are, in essence, responsible for their own destiny.

Brzezinski: Our definition has been one where the client — we kind of struck the word "user" from our vocabulary — is responsible for all aspects of computing, except manipulating or changing mainframe data. We can and do provide support to them, but in a sense, they achieve their end results through the access, support and manipulation of data as given to them by the mainframe caretakers.

A couple of years ago, we went through an assessment of all the money being spent at Quaker's information systems activity. We found that MIS was paying a lot of the bills but managing only 40% of that total dollar figure. If you talk about pure management, how it was being used, it was 40% of the total dollar figure. It was an eye-opener. So end-user computing had been there for a long time but sort of under the covers. Now it's brought out.

Why is the word "user" suddenly taboo?

Brzezinski: It was deemed insulting, and some people made a conscientious effort throughout the entire company to stop using the word, and it's almost gotten to become second nature that you refer to all the people who are outside the MIS area but receiving services as "clients." And that, in a sense, is maybe even a little subordinating, but it's better than the connotation that "user" put on.

End-user concerns in 1986

What are the major concerns of your clients or end users now?

Brzezinski: Data access and integration is overwhelmingly the biggest issue. It started back in the time-sharing days, eight to 10 years ago in our company. Now that the clients have the capability to download data, how do you provide them that easily?

Corea: Our users are concerned about us being responsive to their needs. We can give them the equipment, but they need more than just equipment put on a desk and software installed for them. They're looking for a total support group dedicated to them that they can go to.

Danberg: The roles and responsibilities have been perplexing to us. Where does the client or user's responsibility start and end with relation to the process? We find that the more that end-user computing gets embedded into the process, you've got the same problems you have that stem from the mainframe — the problems of security, fallback and

End users beckon, MIS answers the call

Continued from previous page

recovery, reports and the like.

And yet all of the traditional safeguards that the MIS people have struggled with for 30 years now may or may not be in place. We find that people do some very good and creative work, and then they, for whatever reason, either leave or get transferred, and the process that they've developed leaves with them and isn't easily transportable or maintainable. I'd say that both the user community as well as the MIS division are wrestling with that problem.

Brzezinski: Does the MIS division take on the responsibility to assure that the procedure and business aspect of what they develop is secure?

Danberg: You're addressing the mainframe now?

Brzezinski: No, I'm talking about personal computers.

Danberg: We're beginning to. One of our sister organizations, Transamerica Insurance Group, has done a splendid job. In essence, they have developed a continuum of classes of end-user computing, going from jobs that are management-oriented, either internally or externally, to jobs that are just analytical in nature. Along that continuum there are degrees of control, degrees of auditability in terms of standards.

Data security: Who is responsible?

Brzezinski: I know in our company, the auditors are attempting to have us be policemen for that type of caretaker role. In my opinion, that is really a management issue at the management level outside the information systems department — once the education and awareness of what the dangers are have been expressed. I find it too much of a responsibility to entrust to inside the MIS department.

Danberg: I don't agree. The information officer of the organization, which we happen to be, has a responsibility to insure the valuable asset of that organization, which is information, and that it's used correctly. Just like the chief financial officer has the responsibility to see that whoever may be performing financial applications within the organization is doing it in a correct and consistent format. That's our responsibility; that's what we've been trained to do; that's what we've got sizable budgets to do. And how we implement it determines our success. But I don't believe we can shun that responsibility.

Brzezinski: No, I'm not saying shun the responsibility. You do it through issuing a procedure and training policy like the financial divisions do. But to take on that policeman role and caretaker role for all of distributed applications is asking way too much of any centralized group.

Who should do it?

Brzezinski: The management of that organization. The same way that you as a manager have to manage your own petty cash and expense account type of responsibilities, you have to extend that to know how you use information. It's a dispute in the industry right now.

Danberg: I wouldn't disagree with what you say, Ron [Brzezinski], except that in the same fashion that auditors, either DP auditors or financial auditors, set up standards and guidelines and rules, it's the MIS responsibility to do the same.

Brzezinski: Agreed.

Danberg: Now, who polices it is a question of how the industry matures over time. Certainly, as people become more computer literate — and incoming management in today's industry is by and large computer literate — that policing role will diminish. At the moment, at least as I see it within our organization, if we don't do it, nobody else will. Hence, it's our responsibility to do it.

Baker: Information resources is a service organization just like the other staff organizations in the company. I have a great deal of trouble giving them that much authority and responsibility over the resources that I need to get my job done.

The security thing is overplayed; we're all public corporations, and we publish Form 10Qs and annual reports, and an enormous amount goes out to the public, so why protect the information from our employees?

We spend a lot of money on security that we don't need to. In my own case, I have a PC in my office that is connected to about four other computers, and each one of them has an elaborate logon process. And all of the code words that I need to get into the employee data base and the customer data base and all the others are written on a 3- by 5-in. card that lays right by my keyboard. Executives do not remember logon sequences very well. And you're just wasting your time to make it difficult to get in there.

> ***'Enormously expensive decisions were being made at very low levels in the corporation. The very low-level managers were thinking of very expensive needs that could only be met through expensive data processing projects.'***
>
> — Georgia Power's Grady Baker

I agree with Arnie [Danberg] that some guidelines and rules should come from the people who are familiar with how to secure it, but as far as the security is concerned in the user department, it's their resource and they need to take care of it just like with petty cash.

Brzezinski: Grady [Baker], are you MIS or are you in the general management? I'm having a hard time positioning you.

Baker: About 18 months ago, we had a reorganization, and I got responsibility for the information resources. And then a few months ago we had another reorganization, and I got rid of that thing.

Encountering the end user and meeting expectations

What are some of the end-user-related frustrations you encounter?

Baker: One of the biggest frustrations to general management is the cost of information resources as regards the results. We are continually being oversold on what can be accomplished and, quite frequently disappointed about what is actually accomplished.

> ***'The traditional information systems organization is going to move from a manufacturing mode into more of a maintenance and support mode.'***
>
> — Transamerica's Arnold Danberg

Another thing which frustrates us is the time dimension that particularly mainframe people work with. And general management is used to telling people to do something and have it done by Tuesday. But when you talk to your mainframe processors, they talk to you in quarters, and they say, "We'll do it third-quarter next year," and you know that if they just miss it by one quarter, they've got a nine-month leeway. That's really not what you're used to.

That's the reason, I believe, a lot of managers are migrating toward the smaller processors, because it is possible to do something quickly. Whereas on mainframes, even simple things can be quite complex if they have an impact on executive routines or other programming. And the fact that your mainframe processors are, on the average, two years behind in their programming makes it difficult for you to respond to needs of others quickly.

We've been hearing that for a long time now, and we have to wonder if there ever is going to be some solution to that problem.

Baker: We divided systems into two types: information systems and foundation systems. Anybody who would ever think about running a foundation system on the minis and micros, that's just impossible. You're going to send out four million bills a month or four million reports a month; the mainframe process is the only way to do it. If you're going to keep up with the payroll on 15,000 people, the mainframe process is the only way to do it.

But the information systems — the tools that an executive or clerk or manager needs to do his business — can be very quickly and easily handled on the smaller machines. It has been my experience, and I have access from my office to the large processors, that there's very little data there that I'm interested in, because it's all data, there's very little information.

Corse: It's important that information systems give that direction to the end user also. We have a three-tier approach: We've got a mainframe application, we've got minis and then we've got the personal computer.

A lot of times the end user does not know where logically this should fit. So they're trying to put a mainframe application on a PC. If you are running 10 to 12 hours on a PC, then you've misplaced that application. A lot of times, as Grady [Baker] mentioned, they can't wait two years to get it. So what we try to do is say, "We've got three resources here; let us go in and sit down and help you. What do you want to do? How do you want to do it?"

First off, make your determination — is it really an end-user application or maybe a foundation system? Or maybe we go in and we prototype it at a smaller scale; so that when it goes into the DP side of the house, there has been a lot of groundwork laid. Reports have been defined; you know what you want to do; and results are what you're looking for.

Maybe you put an interim system up without all the bells and whistles, but it gives the end user something to do and you can afford to take the time to get a full-blown DP foundation system going. That's what we think is valuable, because the end user really is trying but doesn't understand all the tools that are out there.

End-user relations: An evolution

How has your relationship changed with the end users in the last five years? Has it gotten better, worse?

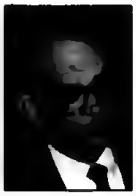
Corse: It's gotten better in our case, because before there was no such thing as end-user computing. We've evolved over three years. What we find is that you can't be all things to all people, and you're always going to have some users who think the sun rises and sets on you. You're going to have others who could care less if you even existed. And that's something you have to accept. You just can't do all things at all times. You have to prioritize your resources and go for the high-payback items when it comes to assistance.

How do you decide which client gets the priority attention?

Corse: What we attempt to do is when they fill out a request for service, we ask them to give us a cost/payback analysis. What are the benefits of us going in and doing this?

If you tell me you can potentially bring a million dollars to the bottom line vs. someone who has a nice thing that will bring $5,000 or $10,000, that makes it easy. What's

The roundtable participants



Grady Baker
Georgia Power Co.

Grady Baker is executive vice-president and general manager of Georgia Power Co. in Atlanta. Before being named to his current position in March 1985, Baker was responsible for marketing and administrative services and in that capacity oversaw the MIS function. He is a technology buff who closely watches the trends and transitions within the MIS world.

An electrical engineering graduate of Georgia Institute of Technology, Baker joined Georgia Power in 1953 and has moved steadily up through the corporate ranks ever since.

According to Baker, Georgia Power spends in excess of $100 million per year on computer-related activities.

The $9 billion investor-owned utility serves 57,000 of the state's 69,000 square miles.

Ronald Brzezinski
Quaker Oats Co.

Ronald Brzezinski is corporate vice-president of information systems for Quaker Oats Co. in Chicago. In this role, Brzezinski is responsible for all computing and communications technology in the company.

Brzezinski notes that the end-user population at Quaker is represented by 2,500 knowledge workers at all levels of the corporation.

With 25 years in the information services industry, Brzezinski has worked in such varied positions as manager of consulting services for Nolan Norton & Co. as well as a professor of computer technology at Purdue University. He has an MBA from the University of Michigan.

Quaker Oats is an international manufacturer and marketer of foods, pet foods, toys, tools, clothing and crafts.

Luciano Corea Jr.
Beneficial Data Processing Corp.

Luciano Corea Jr. is vice-president of office information systems for Beneficial Data Processing Corp. in Peapack, N.J. Corea's department consists of office systems, information center, electronic publishing and small systems and is dedicated to serving the end-user community with office automation, personal computing and fourth-generation language support.

Corea notes that Beneficial has installed more than 1,200 workstations in its Peapack headquarters alone, with the potential of end-user computing on all of them.

Corea has been a member of the DP staff for 16 years and has been in the DP field for 21 years. He is a graduate of Montclair State College in Upper Montclair, N.J.

Beneficial Data Processing is a subsidiary of Beneficial Corp., a large financial service company.

Arnold Danberg
Transamerica Financial Services

Arnold Danberg, MIS vice-president for Transamerica Financial Services in Los Angeles, has spent nearly 30 years in the data processing industry. In addition to his role as MIS vice-president, Danberg serves as director of electronic data processing for Transamerica Financial Corp., which includes Transamerica Title Insurance and Transamerica Tax Services.

Danberg is responsible for providing support to more than 500 financial professionals at Transamerica. He participated in the development of on-line systems with Teleregister and Bunker Ramo Corp. as well as time-sharing services with Computer Sciences Corp.

Transamerica Financial Services, a subsidiary of Transamerica Corp., has more than 400 consumer loan offices in 25 states.

not always easy is the benefit analysis that the user has to give. So it's a learning curve on their side. We attempt to juggle as much as we can, but when push comes to shove, we take the highest payback item.

That sounds good on paper, but I wonder if there's not a lot of gray area there.

Corea: Definitely.

Baker: Very much so. To control cost and prioritize projects, we have something that we call a management council — made up of senior vice-presidents and executive vice-presidents — which meets once a month. Starting about a year ago, we got the MIS manager to come in and make a 30-minute presentation every month on the cost and on what he's doing. And he outlines for every officer in that room the total that he has been billed for information services over the last month.

It was really an awakening for some of them who knew their DP budgets were big, but they never knew how big they were. So we got a very significant senior management interest in what's going on in the information resources world.

One of the things we found was that enormously expensive decisions were being made at very low levels in the corporation. The very low-level managers were thinking of very expensive needs that could only be met through the expensive data processing projects. We found we were doing a lot of things that somebody way down in the organization just wanted. Senior management was not able to test the need adequately.

We have a generation of senior managers — and it is a generation problem, it seems to me — who can't type; and they don't want to type, and they'll never learn to type. They're not familiar with data processing. They don't know anything about computers and are not interested in it as a technology. They're just not equipped to manage it.

Coming along behind this generation of senior managers is another generation of senior managers who will be much more computer literate because they've been taught this in high school, and certainly, you can't hire an engineer now without getting a very good computer expert. They're good analysts, they're good programmers and they understand the whole world. But that senior management generation is coming in, and right now, you're dealing with people who, in general, are not that great.

Brzezinski: Getting back to your question, though. Client computing has probably been one of the driving forces that woke up general management to the idea that there's a lot more complexity out there than they thought.

But, by itself, it did nothing but maybe frustrate a lot of people. And if you couple that, as Quaker has, with a refocusing of all information systems resources and programs and education, this played a very important role in helping educate the general population. That seems to be kind of naturally evolving throughout Quaker right now. We have 1,000+ people using personal computing with daily access.

So the role of the PC or client computing has, in the last two years in particular, significantly increased the awareness of what was going on in MIS; and it just made all the other planning, the committees, the funding — in particular the funding and the funding awareness — easier to sell and communicate.

So I really give a lot of credit to the use of personal or client computing out there in the industry. It's just made our jobs easier, contrary to the way a lot of us looked at it four years ago — as a threat. Hindsight says it's really been a blessing.

Baker: Provided you let your definition of your job move with the times.

Danberg: Grady's [Baker] point about letting your definition of the job move with the times is an astute one, because that's something we need to do as MIS people. There's no doubt in my mind that we're going to find PCs embedding themselves into the process.

Right now, by and large, they're used primarily as analytical tools. But real distributive processing is about to come, if it's not upon us right now. And as PCs get more embedded into the process, the exposure is going to get higher and higher.

And cost-effectiveness comes into play, the question of security becomes an issue, as does the question of accountability — the end user now assumes responsibility for it. And they're going to need support. So the traditional information systems organization we've seen in the past is going to move from a manufacturing mode into more of a maintenance and support mode. That's going to need to be recognized.

What are your opinions of the *Fortune* magazine cover story of a few months ago that said that productivity hasn't really been affected at all by the influx of information systems?

Brzezinski: I disagree. Productivity has increased significantly in many of the areas. Now there are certain areas where it's a status symbol, but we can point to case after case where a lot of our business people are doing things, having much more intelligent access in the use of information.

It has a major impact on productivity in our company, from the vice-presidential level right down to the first level of supervision or clerical.

Can you track that in any formal way?

Brzezinski: We are putting up some benefits-measuring systems to do that. I'm ex-Nolan Norton, and we were big on that. What it amounts to is that if you look at certain sales per employee, we aren't that good yet.

But our mechanisms are coming into place to start tracking it.

Reaping the rewards and measuring the benefits

Have those satisfied users become your best, most enthusiastic backers of computing?

Brzezinski: Let's put it this way, maybe they're not standing up and shouting "Go, go," but what they're doing is encouraging us and not standing in the way, like we'd have seen three years ago. I don't know if anybody wants to be a crusader for

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another department, but on the other hand, by joint presentations and joint discussions of what's going on, we've formed an awful lot of partnerships which we never had before.

That's probably the key, that we have a lot more working partnerships throughout the entire organization.

Corse: We participated in that *Fortune* study. They interviewed our chairman, Finn Caspersen, who's a driving force behind the implementation of office systems at Beneficial. He was one of the few who said that productivity has absolutely increased as a result of installing the systems.

Part of the problem with that article was the industry hasn't come far enough. They're still looking at soft-dollar savings; they're still looking at percentage of gain vs. how much time did I save because I'm a manager or secretary or clerical? That's the wrong target to shoot at.

There's a methodology that's being developed that shows you how to go out and get hard dollars. We were able to go in, in one instance, and create through our network the ability to refine documents on an almost day-by-day, hour-by-hour basis. We estimated a reduce-to-risk and also reduce-to-revenue of a million dollars in one activity that took place over a two-week time period. The dollars are there.

You [Brzezinski] mentioned the Lotus implication. You take a spreadsheet, and in some instances, people are saving tens of thousands of dollars on a simple spreadsheet. The evidence is so obvious that it's being overlooked. It's now commonplace, and the real benefit behind it is ignored.

> ***'I give a lot of credit to personal computing in the industry. It's made our jobs easier, contrary to the way a lot of us looked at it four years ago — as a threat. Hindsight says it's really been a blessing.'***
>
> — Quaker Oats' Ronald Brzezinski

Danberg: It's particularly difficult to measure the benefit. Some of the early claims of office automation were ludicrous. They equated giving a tractor to a farmer and how many acres he could plow vs. how many more letters a secretary could do if she had a word processor. Those are ludicrous comparisons.

Baker: If the farmer doesn't own any more acres, the tractor doesn't mean too much to him.

Danberg: That's right. And if you save a secretary four hours a day, and she has nothing else to do, that's not very much of a savings either. So, we have found in some of our operations that the use of support systems, especially those that do some data base manipulation and word processing, have shown us productivity factors in the area of 40%. We don't know the soft aspect of it — how many errors are not made any longer and things of that sort. The industry has suffered — at least the office automation aspect — from those early claims that were just outside the realm of reasonableness.

Corse: The sad part about it, though, is they're still pushing those same claims for justification. And now, senior management's coming back and saying, "Fine, now prove it." How do you prove a soft saving? And like you said, I'm getting my job done two hours sooner, so I can go play golf. The company hasn't gotten anything out of that.

Baker: There are two ways to improve productivity. One is to automate things that you are doing and the other is to do new things. And the most difficult thing to measure about the impact of information resources of an organization is the value of what you're doing that you couldn't do before, because you have no base to measure it against.

In 1976 we used some of the first 8-bit processors to get a data extract off electric system operating computers, and we made that available in a 300 bit/sec. dial-up to the managers of the electric system. It made us millions of dollars, because the president of the company would get up every morning at five o'clock and he would dial up. And while his printer was going, he put on the coffee. And by the time his coffee was ready, he had two or three pages, and he would sit there and read it.

By the time he got to the office, he was ready to straighten things out. Because *he* did that, everybody else got interested in it. And the fact that information was available on-line made us millions of dollars and a better operated electric system.

Now, that one incident has fired me up, and I've been trying to find similar incidences ever since.

Brzezinski: Only if you start measuring money spent on technology per class of person, such as sales or clerical, but then how do you assign credit to that?

In our company, it's getting to be looked upon more and more as a tool, and I like that. There is still the necessity to have to plan to install a technology, so it doesn't get out of hand. But it is becoming more imbedded in the day-to-day process.

Baker: A lot of applications have

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HEWLETT PACKARD

Business Computing Systems

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to be supported intuitively.

Danberg: As far as the tools are concerned, I would suggest that 10 years from now, you're not going to be able to hire the kind of professional you want without supplying the workstation. Just like you can't hire the kind of secretary you want today and say, "Here's a Selectric typewriter."

How many of your people now use a workstation?

Danberg: Of the professional people that are involved in strategic planning or financial planning or analytical activity, the number is probably in the high 85% to 90% range today. But they're a small cadre of people. That's going to increase as we tend to distribute the computer responsibility — human resources systems to the human resources function, accounting systems to the accounting folks, manufacturing systems out to the manufacturing shop floor.

Are you upgrading the systems constantly, going from an IBM Personal Computer XT, for instance, to a PC AT?

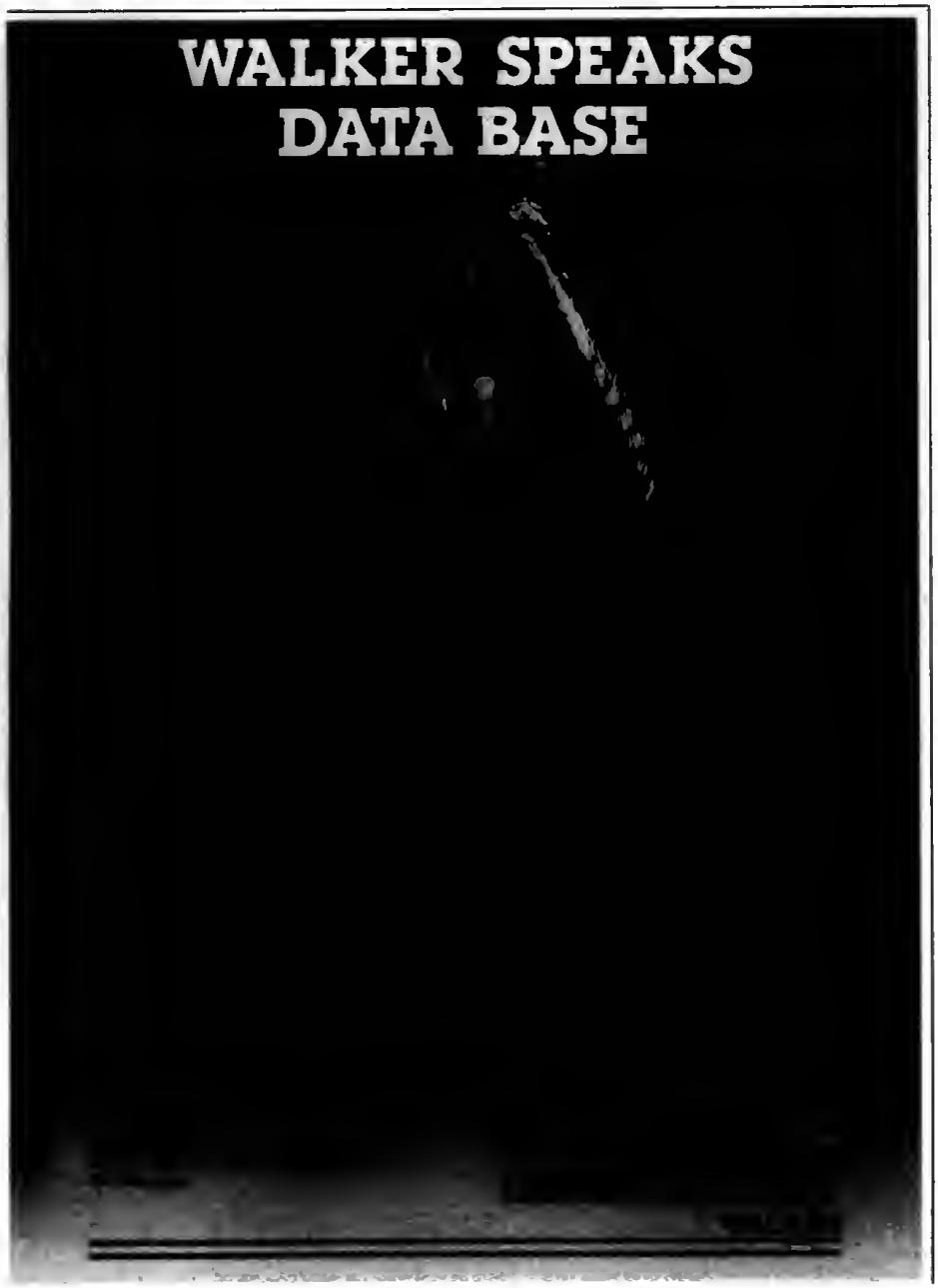
Danberg: Yes and no. We look at each one individually. That's the dilemma — the cost-effectiveness. There comes a point where you download so much data that you've exceeded what was originally a small microprocessor support system; it's now become a functioning system. We try to measure it in terms of exposure: How much exposure does it have? What would happen if it didn't function? We try to exercise control at that level. But there's no answer to that one.

Is there a demand for more processing power on the part of the managers — everybody wants an AT power machine?

Brzezinski: Quaker's gone through a conscientious replacement of more power in certain areas of the company, because the functionality has definitely increased. We put the older machines out to first-time users.

So the low-cost AT clones must be very appealing to you.

Brzezinski: Yes, they are. The vice-president of investment relations just got hers and sat in her office last week and kept saying, "Wow, is it fast."



The PC revolution: Caught by surprise

As you look back on it, did you handle the influx of PCs as you would have liked? Were you caught by surprise, and would you manage it differently today?

Brzezinski: We all went through some learning, no doubt. It depends how fast you adjusted your learning to the reality of the situation. At Quaker, we were very fortunate in that we set up an information center which was probably one of the best ones I have ever seen in the industry. I was not at Quaker at the time it was set up. It was very service-oriented with the objective to educate people.

That was the turning point at Quaker. It has been nothing but positive since then, and that has been two years. We've got six full-time people staffing it. My biggest concern right now is how to refocus that activity.

Cores: We really didn't have a significant PC problem. We were fortunate, likewise, in that in 1983 — when we started looking at end-user computing and we formed the office information system department and end-user support group — we had probably 15 to 20 PCs in the entire corporation.

We had elected to take a departmental computer approach, where we got superminis and then distributed workstations off of that. So what we did was to come up with the three-tier approach. Now what we're finding is that when users come to us and say, "Here's our application," we either direct them to the mainframe, mini or to the PC where the PC makes sense.

Another advantage that we had is that with the system that we selected, we could use existing PCs and they could become satellite terminals on the departmental computer. So, in essence, they had their own computer power on their desks, plus the ability to get into the network and have all the capabilities of office automation. We were fortunate in that we didn't have an uncontrolled growth that we had to react to; we were able to plan more for it.

So you feel like you've got the handle on it now?

Cores: I think we do. It was a little bit of a stepchild for a while, and it wasn't given the attention that it should have gotten, because there weren't that many of them. I said to myself, I've got 1,200 other workstations and 25, 30 or maybe 40 PCs now, so they were kind of pushed off to the side. Now we can form another group which is exclusively dedicated to PC support for training, implementation, review of hardware and application development.

Brzezinski: How many do you have there?

Cores: We have probably 50 to 60 now. The majority of them are on the [Data General Corp.] network.

Brzezinski: We've got about 800. Until the technology stabilized, [Xerox Corp.] was very big; [Burroughs Corp.] was very big when they first came out. Unfortunately, when the IBM system came out, it became a natural standard that everybody wanted just because it was IBM. In retrospect, that was probably the best thing that happened to us. But

trying to standardize at first was a little bit of a mistake. You recover from it very fast. But something had to be done, and we were all learning.

Do you still have these isolated boxes?

Brzezinski: Sure. In some cases we're letting some of our programmers use them at home. Or, where we find a specific need, we can still get mileage out of them. But a lot of them have been around three, four or five years at this stage.

Baker: For about 10 or 15 years, we had a very rigid, centralized processing arrangement. Everything had to be done centrally and the approval process or purchasing of data processing equipment was all centralized. Three or four years ago we began to liberalize, and finally we realized that the manager who can buy a car might as well be able to buy a PC. If he's smart enough to buy an automobile, he probably ought to be smart enough to buy a PC.

The main thing that happened was that a lot of the equipment that had been bought under the guise of turbine bearings or word processors was reclassified as to what it really was. We had generating plants with maintenance information systems being run on word processors. It took six or eight word processors to do it all, but those engineers will find a way to do it.

Corea: That's the key. The end user is going to find a way to do it, either with you or without you. Ideally, it's going to be with you, and the sooner we realize that, the better off we're going to be.

> ***"We've told vendors, "If you, in fact, come in and talk to our users and we find out about it, then we're no longer going to do business with you."'***
>
> — Beneficial's Luciano Corea

Baker: It was about seven or eight years ago that I heard a story about a consultant who went to see a banker, and the banker assured him that all his data processing was centralized. The consultant said, "Are you sure you don't have any small minis or micros sitting around?" He said, "I'm sure." The consultant looked through the bank and found 56 different systems hidden out there.

Is that still going on in some organizations?

Corea: We have central ordering. There's no way you can guarantee that somebody can't get a PC, but we have an agreement with our accounts payable and our purchasing people that any type of PC equipment should come through our area. It's not so much that we want to control what you do, we just want to understand your application a little bit to make sure you're getting what you need to accomplish your task.

Baker: MIS publishes a list of supported devices and software, which means they've got somebody who knows something about it and can help. But if it's not on the list, it doesn't preclude somebody from buying it.

Brzezinski: The biggest reason for the client's trying to use a centralized service right now is that the acquisition, as we all know, is only the small part of the overall cost. With your maintenance cost and your discounts on software and all, it's to their advantage to go through the centralized approach. I don't find any cases right now where people are trying to go around us at Quaker.

Baker: I don't know of any. It's just not necessary.

Brzezinski: Exactly. Attitudes changed on both sides, and it's healthy.

That's for the purchase. What about for writing applications?

Brzezinski: Writing applications is their responsibility. If they need help and support, we will train. But we will not take on the responsibility of writing the applications.

Baker: Ron [Brzezinski] made the point that they refer to the users as clients at Quaker, and we do that at Georgia Power, too. In fact, when I got involved in it about a year and a half ago, one of the criteria for the managers in the MIS organization to be judged on was how many of their clients they took to lunch. It's necessary that they market their services just like any of the other consultant organizations do. It's for the benefit of the company that they use all of the marketing tools that any other sales organization ought to use. MIS no longer has a captive market in any big organization.

Brzezinski: That's nice — a lunch. I've got a full-time client service manager, and he has no people reporting to him. He reports to me. And his whole responsibility is our relationship with the clients.

Baker: We have a client support department that used to be the systems development department. The foundation systems in our company are run by the mother company, Southern Co., and we used to have a systems development department, with about 70 people in it, whose purpose was to interface between the users and the mother company.

I, we did away with that department, and we changed it to the client support department. Our ambition is to have a tag on every PC or every terminal with a name and phone number of somebody from client support. If you have a problem, you can dial that number. That's the optimum situation.

Do any of you have a micro manager, PC coordinator or some equivalent as part of MIS?

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Brzezinski: Our information center manager is that. And it's a direct report to me. All the purchasing per se, the administrative aspects, goes through the purchasing department.

Is there a computer specialist within the purchasing department now?

Brzezinski: No, we provide everything right up until the point of negotiation, and they just take on the contracts because they're pretty good at that.

Corea: We do all of our own within the office information systems side of it. As a matter of fact, we just hired a person from Entre Computer Centers, Inc. It's amazing how much money he saved us in a week just because he has been in the business, he knows the profit margin and he has negotiated with people. Where we were getting 22%, he says it's either 30% or it's nothing. And we've gotten 30%.

What is his title?

Corea: He is an information center PC analyst.

We've broken it down into basically three groups. We have an information center, and that consists of decision support, fourth-generation language and personal computing. Those three groups report to an information systems manager. We have one number to call into the information center for any problem. Someone within that group will get back to you within 10 to 15 minutes.

Vendors: Friends or foes of the end user?

Do you allow the vendors to interact with end users at all?

Corea: No. As a matter of fact, we've told them, "If you, in fact, come in and talk to our users and we find out about it, then we're no longer going to do business with you."

Brzezinski: Wow! I encourage it. Definitely. We could not have done a lot of the things we have accomplished had not our clients worked with vendors. We cannot be all things to all people, and I do encourage it.

I hear the word 'education' over and over. Have you become more teachers than technicians?

Brzezinski: Since November of last year, we have trained over 800 people in one- and two-day courses. We have an ongoing education program. There's a tremendous amount of education. We've got two classrooms set up with PCs. We have eight to 10 people at all times in those classrooms. We go out to our plant areas and do that. But once you get that, what do you do?

Baker: The name of the product sort of implies a difficulty with a central MIS — that is, "personal computer." It is personal, and the use is going to be driven by the attitude and the ability of the individual sitting down in front of it. That's one of the major things we've really been focused on.

Tracking end-user satisfaction

How do you track end-user satisfaction?

Brzezinski: I don't relate to that at all. The only thing we can track is our service to them. But the majority of the activity that goes on is under their direct control. So how do I track whether you're happy today or not? Nor do I care whether you're happy. I mean, yes I do, but there's a lot of other things we have to attend to. By defining the service you're providing and tracking how well you do on that service level, we have our measures and reports. But the service is certainly not on developing and supporting the application.

Corea: We have regular meetings we call information center coordinators. We have a large electronic mail interface, so we go out and attempt to solicit information. And one thing users aren't is shy. They are willing to tell you. And it gets back to . . . Are you willing or can you react to the problem being presented to you? Again, you have to evaluate one user's needs vs. the greater preponderance of them. You may have one or two users who are not totally happy, but then you have 95 others that are.

So you don't have a formal

form that users fill out at the end of a project?

Danberg: Where client computing is of a class where it's application- or process-driven or performing a function, you indeed have the obligation to assist and support and evaluate the effectiveness as a support to them. We find that our users welcome that, they want it. They don't know how to do it. They see that success breeds success. And if they are able show successful PC applications, they are able to pyramid on that.

Brzezinski: We don't really have that many pioneers out there. People want to find prepackaged solutions. You do encourage some pioneering, very definitely. That's where you get a lot of your ideas. But most of the clients out there do want to leverage off of what's already going on.

Baker: Being an engineering-oriented company, most of our professionals are pioneers. The younger engineers in particular have a very broad computer background that they got in engineering education, especially electrical engineers.

> ***"It is middle management that I'm concerned about — trying to get more enthused — because there is where you are really going to get your payoff."***
>
> — Quaker Oats' Ronald Brzezinski

We have nine different computer centers, and those came out of the engineers' own efforts to do their own thing. Engineers will be more apt to run out from under you than others, like financial or accounting.

Danberg: It's a cultural thing. The culture dictates the environment. We, being a financial institution, are by nature very control-oriented. And our operating management is reluctant to try a lot of new innovative things unless they get the support of the traditional organizational elements.

Baker: Again, that's a generation thing. Harvard University, just a couple of years ago, starting making all the MBA candidates buy their own computers.

When this generation of MBAs begins to integrate into the business environment you'll start to see the change.

Brzezinski: Grady [Baker], you can probably not hire engineers and put them into a computerless environment.

Baker: No way. They would feel lost. In fact, I was talking to the head of the electrical engineering department at Georgia Tech, and he was complaining bitterly about the fact that he just got a budget cut.

And the cut he was complaining about was not money, but they had cut his mainframe access time: "How can I train electrical engineers if they can't have their terminal time?" Those are the people coming out, and they will have to have available to them the tools that they've been trained to do the job with.

Senior management support: Is it crucial?

Do you feel you are getting support from top management that you need to service end users?

Cores: In our organization, it started at the top. We put our system in and our chairman of the board and all of our senior management were in the first group to go on that system. In essence, they are saying to the corporation, "We believe in it. We're going to be a technology-driven corporation, and the fact that we are going to be the first people on here should give direction and insight to the rest of the executives that get on board or get left behind." That's one of the keys to success. End-user training, top management support — without both of those, it's not impossible, but it's a heck of a lot more difficult.

Do you consider MIS now to be part of top management?

Cores: As a matter of fact, my boss, who is president of Beneficial Data Processing, is on the operating executive committee, and the vice-

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chairman of Beneficial Corp. was the past president of Beneficial Data Processing.

Is that a recent development?

Corea: No, it happened in 1978. We admitted that without technology, without our computer-based systems, we're not going to survive into the '90s. It has become the heart of the financial organization. I suspect in your areas too, without those systems and without the ability to get the competitive pricing . . .

Danberg: We're evolving into it.

Baker: That brings up one of my favorite subjects. Time after time we're willing to spend megabucks building systems to support our clerks and our professionals. But I haven't seen a lot of effort being put forth to make the job of executive management any easier. My advice to MIS managers is if you want your Hay points to be higher or your titles to be better, then I would pay a lot of attention to what my executive vice-presidents and presidents are concerned with and see if I couldn't develop some solutions for some of their problems. These people make decisions. That is what they do for a living. And I haven't really seen a lot of applications to make that decision making easier.

Brzezinski: I would suspect that in the financial-related industries you don't find that argument as much as you may in a technical industry like yours. By the sheer nature of your business, you have a lot of techies, and they are more concerned with their own environment. In financial companies, you'd find a lot more of the executive solutions already being computerized. We happen to be somewhat of a marketing organization and again, like Lou [Corea], it started at the top. Top management support or involvement is not an issue when it comes to end-user computing.

Baker: What do you do for your president to make his life easier?

Brzezinski: We put on a complete financial analysis and a data-browsing capability that our chairman is the first one to use. He has it at home. And our president uses it at home. They like to browse. They don't like to program. We aren't trying to force them into the programming mode. We keep adding more and more data. They can virtually access the type of data they want within the pace and acceleration with which they want to receive it. As they grow into using more, they'll get it. The point is, you don't go ahead and prepackage big solutions for them and say, "Now learn this." This has been going on for three years now with our executives, from the chief executive officer on down.

Baker: I have a philosophy that any application for a senior executive that requires more than one finger to implement on a computer is doomed to failure.

Brzezinski: I disagree, because it's a personal thing. It depends on the personal aspirations of the CEO. Our CEO likes data, he's a data enthusiast and he likes to browse. But he is not into the idea of programming. So we give him all the data he needs. We make access to it and package it nicely for him. And whether it's one finger or two fingers. . . . What if someone came into you and said, "You're an executive and all you can have is one-finger applications." Would you be offended?

Baker: My hobby is assembler language programs.

> ***'The awe with which the upper echelon is held prevents people who have the tools from saying, "You need something and here's where I can help you." '***
> — Georgia Power's Grady Baker

Brzezinski: You'd be offended.

Baker: I wouldn't pay any attention to it.

Brzezinski: The president of our Fisher-Price Toys Division writes his own programs. He's actually doing benchmarks from one PC vs. another. He happens to be a technology enthusiast. It really is personal, and I disagree with your statement that MIS executives aren't attending to the executive needs.

Corea: Also, the generation change that you are anticipating in the future has already occurred at Beneficial. Our chairman, president and many of our senior vice-president are in their 30s and 40s. They know technology, they've experienced and know what they can do with it. And they utilize it. Some people might use it five hours a day, others five minutes a day.

Making life easier for top executives

Baker: Let me ask you another question. I buy software as a hobby. I see an ad in a magazine, and I'm on the phone with a Visa card and stuff is coming in and most of it is very trashy.

Do you do things to make the mundane things in the office easier for the executive? You've got word processing for the secretaries, which enables them to spend more time with their nails. What do you do for the executive?

Brzezinski: I went to our executive management and put on a workshop

Continued on page 54

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for the chairman on down a couple years ago. And that's after a couple of them already had PCs. The issue was: They need blocks of time to sit down, and most of the really senior executives don't have that block of time because they are busy dealing with people, and so what they want is stuff at home they can use, possibly. And what's happened is they have transferred their PCs out of their office or given them to their secretaries to do routine work.

There's too much hype saying, "Do more for the executive," because you have to find your level of interaction. And I think Quaker is finding its own. It is middle management that I'm more concerned about — trying to get that middle management level more enthused at this stage, because there is where you are really going to get your payoff, not at the upper one. Now how do you get the payoff at the middle level?

> ***'I don't think it's the technology. We've got enormous technology. It's the recognition of the needs that's the problem, both by the guy who needs the help and by the person who can furnish it.'***
>
> — Georgia Power's Grady Baker

Danberg: Your organizations are larger than the one I represent. I find that my problem is that I don't have people on my staff who can relate to the senior management problem. That inability to relate makes it very difficult to say what kind of support system they need. My people tend to be techies. They know how to define requirements and, once having defined requirements, build systems. But trying to define business needs and then trying to develop the necessary technological solution to support that business need requires people with unique talents and skills.

What are you doing about it?

Danberg: At the present, pondering it, quite frankly. I don't know the answer. Certainly we don't see the people coming out of the educational institutions today providing it. They've got the basic knowledge, but they don't have the practical operational experience. My own personal feeling is that it's going to evolve. For years, we've faced the dilemma of, How do people migrate from MIS into the business world, into the user departments? I think we're going to see a shift of people from the user departments migrating into the MIS world. And that may be the conduit by which this is going to happen.

Brzezinski: That's exactly it. Because at Quaker, we did not write the executive systems. Our corporate planning department wrote the systems. But they had a lot of training and cooperation from our staff. So we had a team effort going writing executive systems. We don't profess to understand all the executive needs, and they were better positioned to do it.

What kinds of things are your executives looking for from MIS that they're not getting now?

Baker: There is still a lot of work to be done in that area. Providing them with risk-free experience and intuitive data bases upon which to make decisions is an area where a lot of work could be done. Getting the information from people who run the models into the executive's hands is an area that needs work.

I really am not satisfied with the mundane, day-to-day tools that are provided. Most executives spend a lot of time on the phone, and anything you can do to make that better will be appreciated by them. A lot of research needs to be done there. There's a feeling in the organization that these guys have to be great and superefficient, or they wouldn't be where they are. That's not necessarily true. Most of them were lucky — right place, right time. Then they need a lot of help doing their jobs efficiently and effectively. The awe with which the upper echelon is held prevents people who have the tools from going in and saying, "You need something and here's where I can help you."

Is the technology not there yet?

Baker: I don't think it's the technology. We've got enormous technology. It's the recognition of the needs that's the problem, both by the guy who needs the help and by the person who can furnish it.

Cores: I don't think it's sometimes as difficult as we make it out to be. We've got the DG Comprehensive Electronic Office system, so we've got electronic mail. Our chairman has said that that system has made him 50% more productive, just in the short messaging capability. Not to have to make phone calls. Not to have to sit and dictate. Not to worry about spelling.

Baker: So your chairman can type?

Cores: He can type, but he's not a speed typist. But when you get a message from him, you find out that he is more interested in getting answers as opposed to content and form. If I'm sending a message to you, do you care if I spell "saw," "sew" or "sww"? You don't. And what you find is that a lot of the formality goes out of what we have

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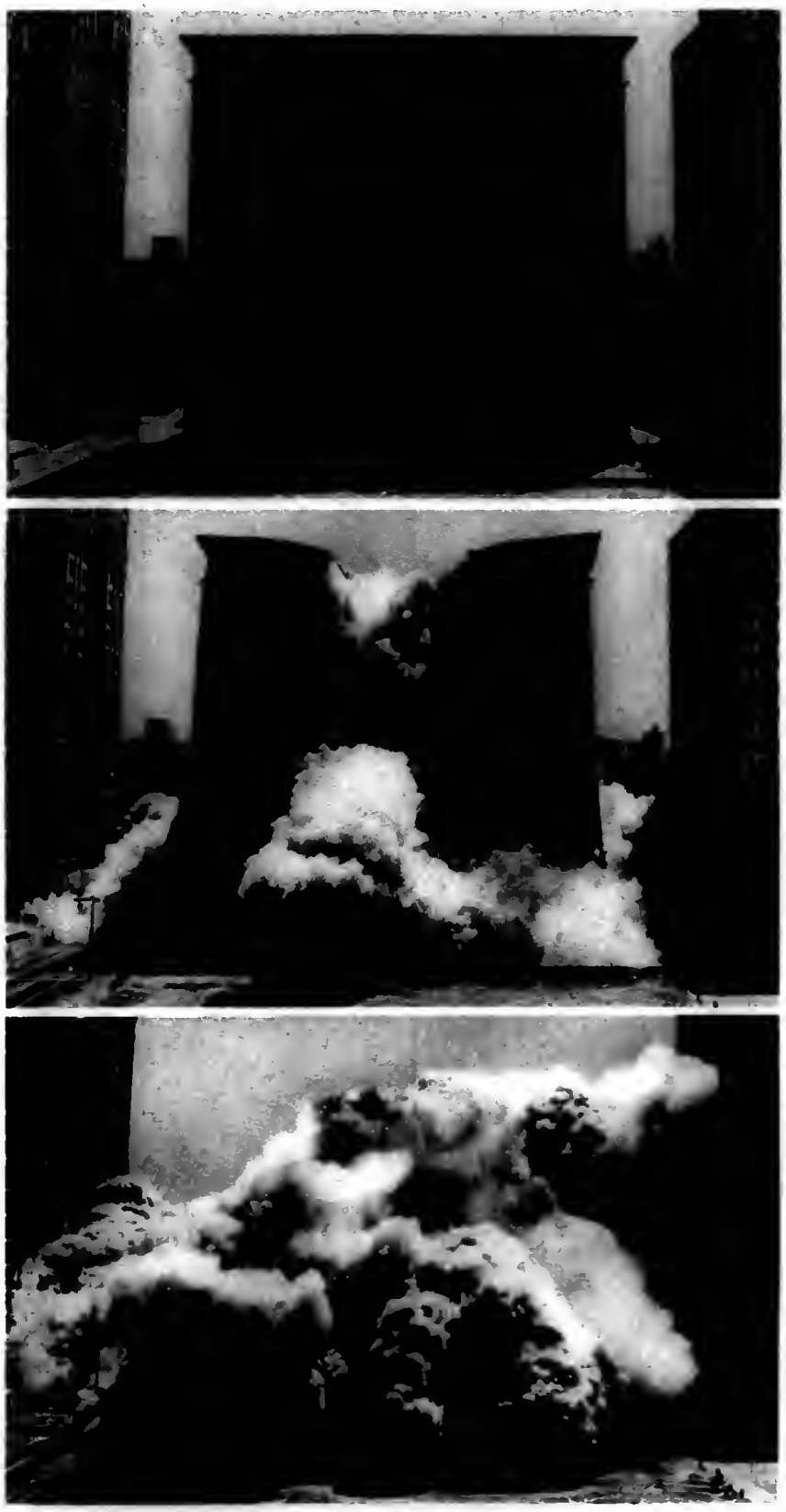

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to do now, because it's expected and it's written and everybody sees it. You also learn that they cut through management layers. If you put workstations on multiple people's desks, you don't need multiple tiers of management to pass things through. The line goes directly from the chairman of the board to whomever he or she wants to send that information request to. And once it comes from the top down the first time, you've broken that barrier and information is free to flow back up to the top. Our chairman has a terminal at home, a portable he travels with. In essence, he's never away from the office.

Baker: People are beginning to write articles today on organizational design or philosophy that say to improve the efficiency of the organization, you need to flatten the organization and widen the expanse of control. That is such a true statement. That is the sort of thing that end-user support can make possible in an organization Quick and effective communication is vital to achieving that. You get better and quicker decisions.

> ***'Once communication comes from the top down the first time, you've broken that barrier and information is free to flow back up to the top.'***
>
> — Beneficial's Luciano Corsa

Danberg: The technology is here. It's integratable. We're crossing boundaries. If you look at the history of MIS, all our systems were based on cost-effectiveness or the cost of doing business. Nobody would deny doing payroll. Nobody would look for the cost-effectiveness of doing a payroll; that's the cost of doing business.

Now we hear the phrases "competitive advantage" and "productivity," both of which are not terribly measurable today. So it requires a belief by senior management that the payback is there. I have to say that's cultural and it's industry-driven. In the engineering-oriented industries, they recognize that. It's highly management-driven. If senior executives believe there are advantages to be gained, even if they are not measurable today, they'll move forward.

The outlook for the future

What is your outlook for the future of end-user computing?

Danberg: I'd have to say it's a field that's evolving. The problems we will be faced with in end-user computing are the problems we've faced as a maturing industry within DP. We're only a 30-year-old industry, and we've made remarkable strides. The old adage was "large systems, large problems, small systems, small problems." I don't think that holds true. The problems are the same. As we embed data processing into the business process through the use of PCs, we're going to have to be very creative in our outlook, in our approach. It's going to be evolving with changing roles on both sides, all for the better, in my judgment.

Baker: There will be a continuing fuzziness between foundation systems and information systems as time goes on. As communications becomes better and better and high-speed communications becomes available, the large processors will be data reservoirs and the data manipulation will be done at user stations, even the very large number crunching that goes on in mainframe processors now. It all will be tied together virtually at bus speed, and small systems will extract the data, manipulate it, produce whatever is necessary and put it back.

Corsa: You will see a blurring between the mainframe, mini and micro environment. It will become transparent to the user. It's not all that far off. You're not going to know where what you're doing is being processed, be it on your desk, on a mainframe or wherever. That will offload a lot of CPU cycles. So you might not see a large growth in host-based processing.

Departmental computers, the 32-bit Digital Equipment Corp. Microvaxes, the DG MV/2000s, are going to play an important role. You're getting a MIPS' worth of power now for $15,000. I'd rather have one of those that supports 15 users in an area at a $3,000-per-workstation cost than PCs on everybody's desk, where I have to figure how to network them together, how to get data back and forth.

Brzezinski: I look at what's happened as a lot of excitement. Within the last two years in particular, a lot of tools have been put in place to take advantage of the many things we've been trying to do for the last 10 years. We're just starting to leverage a lot of the client community talent, resources and ideas, and we are in a position because of the technology to link all this together.

We're buying tools to drop down everything into PCs and further blur the boundaries. My biggest challenge is to refocus the traditional information center. How do you now position what has been a very successful group of people to take advantage of this next era? Of trying to capitalize on the talent out there in the client communities? ■

In Depth

Telecom and DP: Making skills meet

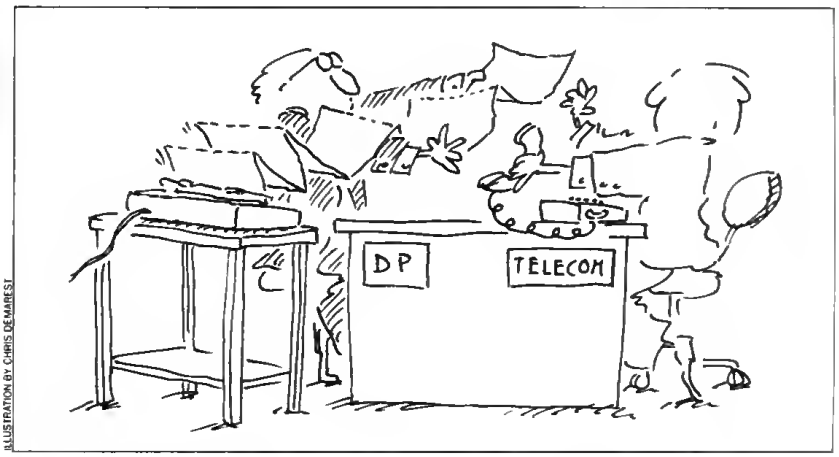

ILLUSTRATION BY CHRIS DEMAREST

The roles needed to manage the integrated technologies are changing, and so, too, should the organization that has responsibility for them.

By PETER G. W. KEEN

For the foreseeable future, the bottleneck in exploiting integrated information technology in general and telecommunications in particular will be the supply of good people, not the supply of the technology itself. This partly reflects the gap between the need and the supply, which has always been a problem in the information systems field. Typical large firms carry backlogs of development projects measured in man-centuries rather than man-years.

Personal computers and end-user software packages have helped cut into the backlogs but have created new ones of their own, as supply creates demand. A rough rule of thumb is that 50% to 70% of information systems staff is working on maintaining or updating existing systems, 20% to 40% on enhancing them and only 10% on developing new systems.

When the tax laws change, a business unit adds a new customer service or IBM introduces an improved operating system, existing programs must be modified. The effort can be huge. When the U.S. Postal Service proposed changing the ZIP code to nine digits, calculations of the cost to the Fortune 100 firms of changes to their basic processing systems were in the billions of dollars.

The problems of maintenance and backlogs will remain with us for a long time. Software tools for developing large systems are improving, but productivity is increasing at a far slower rate than are the demands for new applications.

This constraint, though, is relatively small compared with the fairly sudden shift in the entire skill base required for the integrated technologies. If one knows a person's job title in information systems, one may have no idea what he actually does or what is the career trajectory for the job. The chart on page 60 summarizes the changes from the era of separate applications in the 1970s to the portfolio of technologies and applications for the mid-1980s and 1990s.

In discussing these changes, the acronyms IIT and IS are used. IIT stands for integrated information technology. IS stands for information systems, the corporate development function for the main computing applications. (The old term was "data processing"; "information management" is a more recent one.)

No standard labels

One of the problems in describing what is happening in the field is the lack of standard labels for and descriptions of the broadening range of jobs, skills and roles involved. The chart gives a flavor of the range. When we are short of people in the professional jobs, the problem of building a new human resources base will be horrendous. It will be worst in the area of telecommunications, especially in terms of finding individuals who combine the following, virtually contradictory requirements:

Strong technical qualifications in digital communications and in the integration

About the author
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of communications and computing: The ink is scarcely dry on the diploma.

Strong operational experience — older and with obsolescent knowledge but solid understanding of large-scale commercial operations.

Proven management skills — something few technical specialists have the desire or even the talent to acquire, wanting instead to build systems.

Knowledge of the business — Where does technical staff get the lateral development and exposure to build the knowledge? Where do they find the time to keep up in the technical field as well?

Few people combine this mix of skills; they are at a premium in the marketplace. As firms recognize the importance of telecommunications to their business strategies, they are willing to pay whatever is needed to get these people.

It is not just managers who are scarce: Technical specialists in advanced telecommunications are always hard to find — and to keep — because the field is changing so quickly. Younger staff members with Ph.D.s in computer science often lack a real understanding of the operational side of telecommunications. On the other hand, the older ones need a sabbatical to update their knowledge base, but they cannot be spared from their existing work.

The problem is not simply one of a limited supply of bright, educated, motivated people, nor is it one of salary. Over time, the market will alleviate, if not eliminate, that shortage. A far greater problem is that while a firm can go out into the market and bid up the price for first-rate technical talent, organizational experience has to be built, not bought. Telecommunications for business strategy involves building the human equivalent of a wine collection. The intellectual crop of 1986 may be the best since 1888, but the wine has to mature for years.

Of course, not every technical professional needs to acquire those skills. But more and more aspects of exploiting the information technologies depend on the hybrids — people who combine strong technical and adequate business and organizational skills or strong business and adequate technical ones. They are the human resources base for the new IIT organization. They do not have career paths, because their jobs never existed. They have only career trajectories — and immense career ambiguity (see chart page 61).

Career ambiguity

IIT increasingly relies on taking people who are on a technical trajectory and moving them toward a business/organizational one. For example, the information center is an IS innovation designed to help business units build their own development capabilities. They can use end-user software to build their own planning models and spreadsheet reports or design a small-scale management information system. ("End user" is a vague term that basically means that anyone with analytic skills can learn to use the tools; professional training and experience in information systems is not required.)

The skills required to staff and run an information center are very different from the skills of traditional IS development. Technical experience is far less important than personality.

In many ways, the information center is a marketing and consulting arm for IS. It is a service role helping business units, not a technical role building applications.

The best programmers may be ineffectual in the information center, where they reside as professionals with strong standards and focused skills who have to support amateurs muddling through ad hoc projects and perform "quick-and-dirties."

Managing the information center is as much an organizational as a technical role. What is the career path? The job has never existed before. The center's manager has been pulled away from the technical career trajectory and runs the risk of becoming a mediocre technician and of no longer being part of the mainstream of IS.

At the same time, the manager is not a real finance or marketing professional, however many systems his information center helps the finance and marketing departments build. In this way, too, the junior personnel in finance, those who have learned Lotus Development Corp. 1-2-3, Information Builders, Inc. Focus, McDonnell Douglas Computer Systems Co. Multiplan or any of the other myriad new tools for end-user development and who now work almost full-time on building applications that use them, are not real systems professionals. In fact, they possess only a smattering of technical skills — not enough to get jobs in IS. They are also no longer moving along the traditional career path in finance.

The situation is extremely ambiguous on both sides. integrating the information technologies and bridging the culture and knowledge gaps between technical and business people at senior, middle and junior levels largely depends on maximizing career ambiguity for some of the best talent in the organization.

Just a few examples of areas without clear career directions include office technology, telecommunications planning for business innovation, supporting personal computing, defining information needs for customer service, product development for electronic delivery, financial planning for IIT, training users of personal computers, developing strategic plans for computer-integrated manufacturing and selling technology-based products such as electronic cash management and dealer order entry systems.

In some large firms, senior management's response to the problem of ambiguity is to tell the people concerned about the issue, "Don't worry — you are the ones who will be running the firm 10 years from now." Those concerned do worry, and they need an environment in which what is promised is a privilege, not a punishment. Systematic lateral development and movement of people from IS to business units and from business groups into IS for periods of six months to two years should become an institutionalized part of the way the firm grows its human resources.

This is happening in very few companies, except ad hoc. A frequent pattern is that the junior analyst who builds planning models for the marketing department is initially seen as Superman and quickly becomes indispensable — and unpromotable — and eventually moves on to another firm to do the same job. The junior analysts who stayed within the traditional career framework move up the traditional ladder.

Growing hybrids

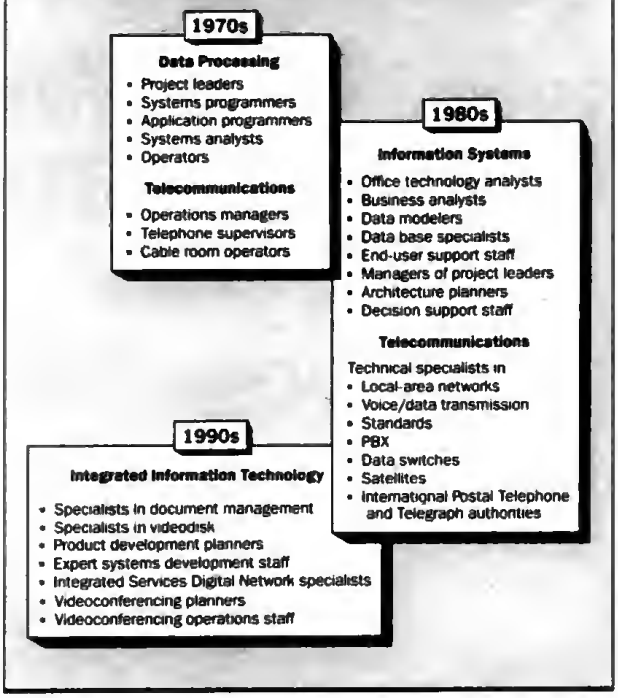
The hybrids are the new blood of the organization of the 1990s. For them to grow, they must have management attention, if only because in a time of ambiguity people will watch what management does, not what it says. There are many formal and informal ways senior and middle-level executives can help:

- Selecting the best junior staff for the lateral development that builds hybrid skills.
- Redefining the management fast track to require experience in taking full and direct responsibility for some aspect of IIT.
- Helping break down the physical and psychological isolation of the IS organization by insisting that staff be temporarily assigned to work in business units.
- Providing first-rate instead of expendable supervisors to provide user involvement on development projects.

All these are relatively

The changing nature of DP and telecom jobs

New technology reorganizes job categories and departments: DP became information systems and will merge with telecom in the next decade.



simple contributions upper management can make.

Organizing the IIT function

The roles needed for managing the integrated technologies are changing and so, too, should the organization that has responsibility for them. In most firms, that organization consists of a central information systems function plus divisional IS units, a corporate telecommunications group and any number of fragmented units that handle some aspect of voice and data operations. The function of the telecommunications group largely depends on the stage the company is in in the shift from a technical utility to a coordinated business resource.

The specific mandate, structure and relationship of IS to senior management and to the wider corporate organization largely reflect the historical development of DP and the communications utility. Very rarely are these a conscious response to the realities of the electronic marketplace. A new approach to organizing IS is needed.

Organizing is not the same as organization. It is easy to draw new organization charts and shuffle jobs around. Organizing implies a much more dynamic emphasis on communicating and on roles — literally, the parts workers play — rather than on tasks.

On the whole, telecommunications and information systems organizations have been defined more in terms of tasks — projects, specialist skills, technical niches and responsibility for specific applications — than roles. The key themes in organizing IS relate to building systems and running corporations.

> ***Organizing is not the same as organization. It is easy to draw charts and shuffle jobs around. Organizing implies a more dynamic emphasis on communicating and on roles than on tasks.***

Coordination, not control

The new roles relate far more to marketing, communicating, supporting and planning. But the old skills remain essential. If anything, solid, reliable operations are more, not less, important when failures affect service and are seen by customers instead of being hidden behind the walls of the data center. But the new information functioo is a full service function. This means that the following become the tasks for organizing:

- Coordinate the planning, implementation and use of the information resource, balancing central direction with decentralized application.
- Shift the organization for IIT toward being a staff function comparable to corporate finance, instead of existing mainly as a unit that builds systems.
- Amalgamate telecommunications and information systems within the IIT organization as interrelated departments within the information company, not independent functions.
- Use human resource planning to drive, not follow, technical planning and implementation.

The chart on page 62 shows the likely formal organization structure that will result.

No organization chart can communicate the main role of the IIT functioo — to find a suitable level of centralization to coordinate the integrated business resource. The main principle for managers of IIT has to be, "Respect the reality of decentralization and establish the criticality of coordination."

Very roughly, this means that the key infrastructures, especially telecommunications, require moving toward centralized direction and that building the applications that carry the traffic and making decisions on what traffic to add should be increasingly decentralized. If the architecture is clear and technical standards are backed up by rules, guidelines and procedures, distributed IS units in the business groups can handle most development needs. This is a very big if.

Guidelines with teeth

B. L. Williams of the consulting firm Arthur D. Little, Inc. provides a useful framework for assessing the degree of centralization of any particular telecommunications organization. He defines a spectrum of decision-making authority ranging from fully autonomous to integrated/centralized.

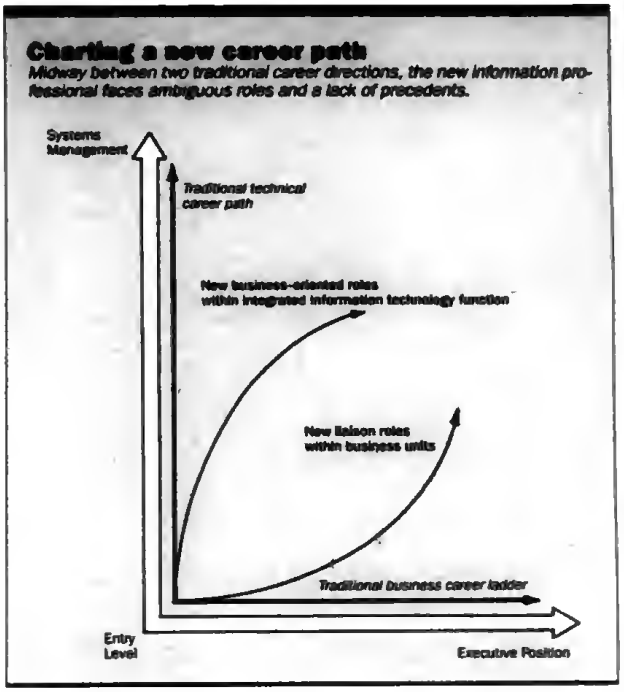
Each extreme seems undesirable. Autonomy — with every unit making its own decisions — means that a corporate resource, as opposed to a set of incompatible technical facilities, will never be created. Full centralization contradicts the principle of decentralized decision making, which is one of the most basic realities of modern business.

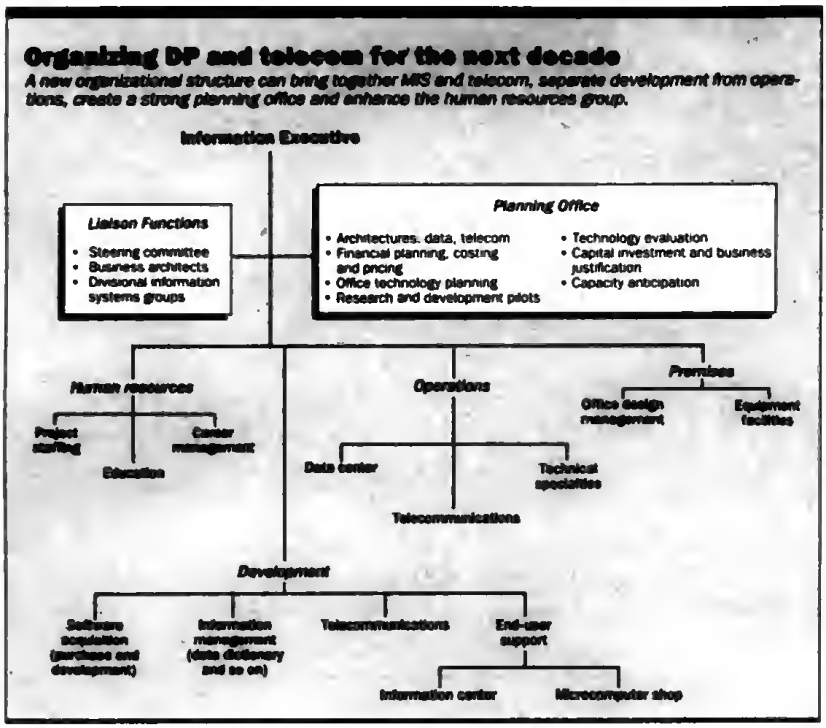
The two intermediate positions, guided and coordinated, are unstable — they combine a little of each extreme. They both have many merits, but they can be made to work only if senior management defines a vision to justify them, establishes the policies to make them possible and clarifies the authority and roles of the centralized architect and planning unit and of the decentralized business operations (see chart page 63).

The phrase "guidelines with teeth" addresses the issue of authority. "Standards" is an ambiguous term. It can mean anything from a set of recommendations that can be ignored by business units to a corporate architecture in which no local discretion is allowed. The technical standards may be the same in both instances; the key question is, Who either enforces them or decides on exceptions?

As one telecommunications manager in a major international consumer goods firm discovered, publishing a set of standards does not answer that question. His company, Quintex, Inc. (this is a pseudonym), planned to install a common worldwide financial reporting system. To support this, the manager defined a set of computer and communications standards to be followed by each division in each country in which Quintex operated.

The head of Quintex's Taiwan subsidiary decided not to wait for the new system. The volume of





business was expanding rapidly, and existing computer systems were inadequate to handle the unit's needs.

He approved the purchase of a software package that ran on a nonstandard computer and used the equipment manufacturer's nonstandard communications protocols.

The corporate telecommunications manager tried to get the decision overridden. He pointed out that he had been given the responsibility to define a company-wide policy and that Taiwan's action threatened the whole concept of shared computer systems, common reporting and integrated communications.

The head of the subsidiary responded in a memorable telex that he had been given the responsibility to make profits for the firm, that he had immediate needs and did not intend to sit around and wait.

The communications manager responded that the local decision threatened long-term integration. He argued that it would add costs in the end and slow down the implementation of the worldwide system. He lost the argument, and Taiwan has its independent communications facility.

It is not easy in such instances to decide who is right.

Here it did not matter: The senior business manager had the authority, the communications manager had nothing more than a piece of paper, and might was right. For standards to be effective, they have to have teeth.

Quintex's communications manager recognized this after the fact. He asked the information systems steering committee, which set policy for computing and communications, to clarify this mandate.

The manager listed the benefits from the integrated approach and the costs of local autonomy. He accepted that sometimes exceptions would have to be made but argued that he must have, if not the final say, then at least some real influence.

He wanted a preliminary veto: All local systems must follow the standards, and his unit's approval should be required for any deviation from the standard. He would have vetoed the Taiwan proposal and suggested they find an alternative package.

If Taiwan wanted the veto overturned, they would have to make their case to the IS steering committee. He said, "The onus should be on the divisions to justify exceptions, not on me to justify the standards."

The corporate architect

Most large firms have an architecture or are trying to define one; that is a basic requirement for any coordinated communications plan.

These firms need to make sure they clarify the role of the corporate architect.

At the one extreme — fully autonomous management — the corporate architect is a staff adviser and at the other — fully integrated and centralized management — a controller.

Guided or coordinated management requires a custodian — someone who can guarantee the integrity of the overall architecture while adapting it to special needs and exceptional situations. This means having at least a preliminary veto. Quintex's manager defined an architecture, but his role as an architect was not made clear.

In almost every firm in which telecommunications is seen as more than an internal technical utility, the trend is toward centralization.

This assertion is based on analysis of almost 50 large companies, half of which are U.S. and half European. They come from every major industry.

The analysis is based on published and private documents and was carried out in mid-1984.

The firms include Exxon Corp., GTE Corp., Citibank N.A., Federal Express Corp., Connecticut General Corp., Merrill Lynch, Pierce, Fenner and Smith, Inc., Chase Manhattan Corp., Sears Roebuck & Co., American Express Co., IBM and Lockheed Corp. in the U.S. European firms include Sainsbury and Tesco Stores PLC, Scandinavian Airlines System, British Leyland, Ford Motor Co. in the UK and Germany, Grand Metropolitan PLC and Barclays Bank PLC in the UK.

Regardless of their specific strategies, almost every firm is trying to resolve the issue of how to get centralized coordination. None of them want to push toward more decentralized planning, although most of them favor decentralized network operations. The firms with central units that are most successful politically and technically share the following characteristics:

- The central group plays a strong consultancy role for the other units. The central unit relies on having a pool of first-rate technical staff to encourage the other units to draw on it; rather than try to control by fiat, the central group controls by incentives and expertise.
- They have a clear mandate to design and maintain the optimal topology for the corporate network, supervising almost every aspect of planning and operating facilities that are identified as "corporate."
- They use accounting mechanisms and provide service and support functions to

A range of telecom management styles

On the spectrum of management styles, the extremes — "local autonomy" and "centralized" — are undesirable. The intermediate positions offer many benefits but require vision and clear lines of authority to achieve balance.

	Strategy	Role of Corporate Telecommunications Group	Telecom Standards	Corporate Priority	Organizational Pros and Cons
Local Autonomy	Business units take full responsibility for planning operations	Advisory only; may coordinate investment plans	Minimal, if any	Cost-efficient local operations	+ Matches planning, operations to decentralized units' very different needs and environments – Guarantees incompatibility; no basis for gaining economies of sharing
Guided	Local autonomy plus central unit to provide technical and planning assistance	Provides guidelines and consultancy services, especially in areas involving new technology	Standards are recommendations based mainly on technical and cost issues	Cost-efficient local operations plus providing economies of expertise	+ Builds small, highly skilled advisory group that local units can draw on – Standards often ignored, since authority lies with local units
Coordinated	Central group plays strong staff role and sets criteria for long-term planning and investment	Coordinates planning and may supervise operations of some corporate facilities	Guidelines with teeth; corporate group has some authority to ensure standards are followed and to approve exceptions	Balance between centralized coordination and decentralized development and operations; creation of flexible architecture to provide integration path	+ Provides base for corporate highways with local freedom about traffic – Frequent ambiguities or conflicts of authority
Centralized	Creation of a corporationwide set of shared utilities and common delivery base	Directs planning and operations; ensures standards are followed; may leave day-to-day operations to local units	Standards are rules to be followed	Corporate rather than local cost-efficiency; creation of shared corporate resource	+ Provides clear links between corporate business planning and telecommunications planning – Frequent opposition by local units to central "czar"

ensure credibility, equity and incentives for their client units.

The accounting mechanisms include charging by use, not budget, with a predictable standard cost per unit — such as a transaction or monthly subscription fee per terminal. Another mechanism is providing both consolidated and detailed billing reports so that user managers can predict and control their level of computer usage. Many of the firms try to set their prices below the outside market rate.

In many of the firms, especially outside the U.S., operations relocation motivates coordination; many of the firms are moving information systems and administrative units away from central cities. Another coordination trigger is office technology and a general concern with reducing overhead and staff costs.

A third force toward coordination is simply underestimating growth in demand for telecommunications. One oil company anticipated and planned for a 20% increase per year in the number of terminals in use between 1980 and 1985; the actual figure was 70%. Bank of America anticipated in 1982 that it would process 80 transactions per second on its mainframe on-line systems by 1986; in 1984 it revised the estimate to between 500 and 1,000. A British insurance firm based its five-year plan, beginning in 1986, on the assumption that it would have one workstation for every 10 workers by then. By late 1985, the ratio was already 1:3.

The information executive

Information executives possess the authority to guide and coordinate. However, they are not czars. Much of the executive's role involves liaison and negotiation with corporate and business unit managers and with divisional IS units.

Some of the mechanisms for two-way coordination include steering committees, liaison units for applications and formal and informal planning groups that include representatives from the business units, divisional IS groups and all other groups affected. The job of these committees is to establish priorities and plans and to resolve issues of resource allocation, phasing, staffing and project management.

One key liaison mechanism requires much senior management direction or attention, especially when the firm is trying to accelerate its use of technology to make major business moves. That is the top policy committee of managers who can make things happen and who share, review and update the corporate vision for telecommunications and make it credible.

This is not just another committee. If it includes two or three of the most senior managers in charge of key parts of the business, a few who may be more junior but are recognized in the firm as innovators and opinion leaders, plus the head of any corporate function who is a very powerful force in the firm, then the title of the committee is irrelevant.

Citibank's Institutional Banking Group called its planning committee for international electronic banking "the gang of seven." Tom Theobald, the committee's head, assigned some strong personalities from marketing to direct its efforts. One of these was famous for his aggressive moneymaking for the bank.

The technical organization in the international bank was very weak, and no bland committee could have given it the political muscle that the gang provided. The selection of these people sent a clear signal to the rest of the firm of the importance the bank placed on telecommunications.

Cross-fertilizing in planning

No firm that is trying to move quickly to exploit IIT possesses the in-house skills needed to direct its planning. IS and telecommunications leaders need accountants to find ways of funding, costing and pricing what is now a complex economic good. They need marketing experts to shift to a service role.

The information center, support for end-user computing, assignment of client or account managers to handle particular business units' needs and the development of business systems analysts are only a few areas in which information systems and telecommunications groups are adopting a market-oriented rather than product- and application-based service role.

But these groups possess very little knowledge of marketing principles and techniques.

In the same way, IIT needs economists to help in forecasting, pricing and modeling the relationship between the business plans, the external environment, vendor strategies and trends (especially IBM products and prices and telecommunications costs) and the technology strategy.

It increasingly has to be able to draw on people who understand ergonomics, psychology, education and human resource planning, because every aspect of IIT is now intrinsically linked to behavioral and organizational issues.

Sincerity is no substitute for technique. The best IIT organizations are sincerely doing their best to broaden their planning bases. But sincerity just isn't enough. Technique comes from the following practices.

- Systematic cross-fertilization between the IIT unit and the wider organization, by recruitment and temporary assignments from within the organization and by distributing development and support staff to the business units.
- Using consultants and academics to bring in new knowledge and avoid personal obsolescence, to provide an integrating perspective and to help educate and advise senior managers.
- Hiring, growing and retaining good talent.

A few of the planning areas for IIT have to be addressed by some combination of these three sources of talent (see chart page 62). Obviously, it is up to the IIT organization to handle most of these aspects in the short term the best way it can; for the long term, they should rely on human resource planning.

To encourage staff to seek and accept the temporary assignments to or from IIT necessary for cross-fertilization, present such jobs as a privilege accorded to the new "fast track."

Reassure the assignees either by guaranteeing a position to which they can return or by creating permanent liaison roles.

Insist that there be no poaching. Many IIT units report that their users, quite sensibly, try to retain any good people who have been loaned to them.

Remember that the goal is

to build a cadre of hybrids. Time the lateral development carefully: It is silly to take someone who has 20 years' technical experience and very limited exposure to the business and expect him to be credible or effective outside that sphere; the vice-president of systems development should not become an overpaid apprentice in marketing.

Conversely, if trainee programmers are shipped out to the finance department, they are of little value, since they have not yet mastered their own trade.

The best time to make the move seems to be between two and five years after a person's hiring. The time spent in the other department should last no more than two years so that the person's old knowledge does not become obsolete.

If 10% of incoming recruits are targeted for such a process in both directions, the long-term human resource problems for IIT will be solved in about five years. The sooner a firm starts, the quicker the chief bottleneck that hinders the exploitation of technology's opportunities will be unjammed. Good IIT managers and good personnel managers know this. They generally cannot do much to solve it, because it requires both senior management initiatives and clear signals from the top that this is the path for the future.

As for consultants, in all fields there are bad and good consultants, greedy and responsible ones, merchants of hype and solid professionals. It can be hard to tell which is which, especially in new technical areas.

The best advisers often apply their business experience to a new area involving technology, although they will not have built the systems they are recommending. The top technical specialists apply their insights to a new aspect of business but will not be able to show success in it.

Getting a sense of options

Often senior executives bring in academics or well-known experts to help them get a sense of the main options and issues. When they do, however, DP managers should beware of joining the fad-of-the-month club.

For example, when *Business Week* published a cover story on the coming wonders of expert systems, many IIT managers groaned. The article, like so many on a hot new topic in the field, gave senior executives false expectations about the progress in expert systems and artificial intelligence. It led to them pushing for action and bringing in experts to talk about what the firm should be doing.

These experts often come from a scientific or academic environment where their experience is with small-scale applications or pilot projects — that is where work in the state of the art is being done. However, they have no understanding of large-scale commercial processing and operations, of organizational aspects of information management.

It is not that their knowledge is invalid — only their extension of their knowledge to the world of business and business uses of technology.

Differences exist between the worlds of scientific/academic and large-scale business computing. In scientific/academic computing, analysis is complex in terms of methods, models and computation. Data structures are complex, but volumes are low; software is advanced. The technical base is a stand-alone or simple time-sharing computer, and "architecture" refers to the hardware. The organizational context is of limited relevance to a technical decision, and implementation is equivalent to installation. The application is the strategy.

> ***It is silly to take someone who has 20 years' technical experience and limited exposure to the business and expect him to be credible or effective outside that sphere.***

In commercial computing, operation is complex in terms of project management, coordination and procedures. Volumes limit the complexity of data and the practicality of software with high overhead and inefficiency. The operating system and architecture dominate decisions; architecture relates to the integration of the organizational resource. Organizational interactions are driving factors for decisions, and implementation means making the system work organizationally as well as technically. Business operations define the strategy.

Learning by example

Bright people who operate only from experience and assumptions often make IIT managers look like anti-intellectual Neanderthals; these managers are put on the defensive.

Until very recently, the field of information technology in large organizations held substantial barriers to entry: Managers had no experience in the trenches of systems development or telecommunications operations. That barrier has been removed.

The areas in which firms most often need top-level advice are the ones in which such experience is not necessarily relevant. Business planning for telecommunications is one such area. The best advisers will be people who are thoroughly up-to-date on developments in the International Standards Organization's Open

Systems Interconnect and advances in local-area networks, value-added networks or digital private branch exchanges (PBX).

Examples of instances in which the inexperienced adviser says "It's easy" because a concept is proven or a framework is available include large-scale data base management, international standards for telecommunications, implementing local-area networks and voice/data integration. It is not easy to implement these advances, and it is misleading to persuade managers that it is.

The IIT field is grasping for ways of making sense out of the bewildering changes and dilemmas firms face. But the firms need simple, not simplistic, models. How do they tell the difference? The deep and the shallow thinkers all use the same transparencies in their presentations. Conceptual models and mere motions look and sound the same. The deep thinkers have a base of proven results, either their own experience or the successful implementation of their recommendations.

Sometimes a leading adviser, especially on the busy conference circuit, comes up with a useful framework or striking message. That speaker will be in constant demand. The temptation is then to stop learning and to stick with the one idea, well and often wittily presented. Again and again in IIT, good academics and consultants have used up their intellectual capital by turning it into temporary income.

This is a problem of intellectual adolescence. IBM represents the orthodoxy of information technology. Many of the Young Turks in the consulting field are explicitly anti-IBM.

There is a lot of truth in the criticism of IBM. The new IBM is not the old one. It has been the aggressor, not the follower, in the market. With all its faults, it has moved to head off all its competitors — even AT&T — except the Japanese. This now is the battleground.

Most important, it has established its architectures, rather than its products, as the reference for the field. IBM's Systems Network Architecture is the de facto standard. That is why every major manufacturer of computer and telecommunications equipment has adopted it. Its personal computer has never been the best in the field, nor have its office technology products generally matched the best of other vendors.

Experienced IIT managers and planners know all the pluses and minuses of IBM, from the value of the plastic wrapping to the cost of cumbersome operating systems.

For them, the issue is, "If not IBM, then who?" For the new generation of consultants, the response tends to be, "Not IBM." As a knee-jerk reaction, that is as absurd as the stereotypical old-line DP manager's reaction, "Only IBM, of course."

Choosing an adviser

Does this person understand the craft of large-scale information systems and telecommunications development and operations? Has he worked on a really big project (involving at least a dozen people for a two-year period, say) from inception to operational use?

If not, there is a fairly strong risk that he overlooks the complexity of the management process and interaction between technical and organizational issues in large-scale business applications.

> ***"Experienced IIT managers and planners know all the pluses and minuses of IBM. For them, the issue is, "If not IBM, then who?" For the new generation of consultants, the response tends to be, "Not IBM." That is as absurd as the stereotypical DP manager's reaction, "Only IBM, of course."***

One cannot simply extrapolate from scientific projects that involve small, simple or well-structured data bases, or from personal computers and local-area networks, to an environment marked by a myriad of interdependencies.

What is the candidate's pedigree, in terms of intellectual base and the quality of the firm(s) he has worked in? The exemplary firms described provide their people with a training ground that in itself adds a value to the employees' own qualifications, job titles and project experience. The same is true for the very best of the computer and communications vendors.

Does the adviser know the field, in terms of the research literature, what is going on in the leading vendor and user companies and what the practical state of the art is? Ironically, at a time when the field of IIT needs a combination of first-rate analytic ability and some mix of breadth and depth in business and technical areas, anyone can become an expert. It is very easy for people to grab at the latest fad term or hot topic and sound convincing. This happened in the early 1980s with office automation and more recently with expert systems. It is increasingly commonplace with business telecommunications, which is among the hottest of all topics.

The reason senior managers have to address the issue of how to validate outside advisers for IIT is simply that they have no choice but to

use them. The same is true within the IIT organization. Bad advisers do damage, however. They raise expectations about what is practical, mislead the organization about the risks and returns and add to fog and fantasy, not vision.

Development and operations

The most immediate change large firms have to make in how they organize the IIT unit is to move from having information systems and telecommunications as separate functions — each with a development and operations unit — to splitting the IIT organization into a development arm and an operations arm, each of which includes both telecommunications and information systems groups.

In many large firms, telecommunications and information systems have evolved on largely separate paths. In addition, the pace of change in communications from voice and analog to digital technology and in information systems from automation of clerical processes and batch systems to a broad range of on-line and data- and communications-oriented applications has increased the fragmentation of responsibilities and authority.

> ***Bad advisers do damage. They raise expectations about what is practical, mislead the organization about the risks and returns and add to fog and fantasy, not vision.***

The company then has voice specialists who do not understand data communications, data communications staff members who disdain data processing as a technically unsophisticated function and DP specialists who view telecommunications in terms of the software requirements for on-line applications. The development staff possesses up-to-date technical knowledge and relatively little experience, while the operations personnel have the solid experience and an obsolete knowledge base.

The cultures have to be brought together and the organization based on each one's strengths.

In the development arm, the information systems functions include the following:

Software acquisition to build and buy applications. The trend is toward buying packages, end-user software and fourth-generation languages. Standards for system compatibility are important.

Information management. Data is among the most valuable traffic on the network highways, and the delivery of and access to data via telecommunications is a competitive resource. Data base management software and procedures and technology to create the data architecture shift the focus in IS from programming to information resource management.

End-user support. An information center should be a do-it-yourself store for nontechnical people to develop ad hoc small-scale systems and should offer assistance in acquiring and using microcomputers.

First-rate operations remain critical. Reliability, security, response time, smooth installation, maintenance and troubleshooting translate to quality of customer service in the business resource era. When the network is down, the business is down.

The old-timers are not obsolete — they provide a critical skill. Rather than turn them into mediocre development supervisors (and the digital communications whiz kids into ineffectual managers), surely it makes most sense to recognize that strategy needs cables as well as vice versa.

Last but not least: facilities

The final major innovation in organizing for IIT is one whose importance is easy to overlook; the fact that the office of the future is very physical in nature and telecommunications has tremendous implications for office design and administration and vice versa.

Many telecommunications-related functions are controlled by administrative service units, especially at the local level. Now, when an employee moves to a new office, there can be several hours of work needed for drilling and cabling to install a workstation.

Furniture, lighting and desks have to be picked on the basis of ergonomic and health and safety factors for users of terminals. No office can be designed now without careful attention to cabling for local-area networks, PBX and an employee-workstation ratio that is virtually certain to move close to 1:1 during the lifetime of the building.

The information executive needs new authority over many aspects of office design and must supervise any relocation of business operations and control the planning of office equipment and facilities. This aspect of IIT is very different from development and technical operations.

Facilities management has traditionally been a subset of administrative services. The move is now in the other direction. One manager of IS in a large insurance firm is quite candid about his objective here: "I want to get full control over administrative services, because by 1990 the main evaluation criteria for my group's performance will depend on trivial details that they now handle." ■

MANAGEMENT

TAKING CHARGE
Mitch Betts
and David A. Ludlum

Pregnancy and VDTs

If you thought the study of the effects of VDTs on pregnant women by the National Institute for Occupational Safety and Health (NIOSH) would be the end-all of VDT studies, take a closer look.

The study will focus on whether VDTs cause miscarriages and birth defects among women who use them. But in approving money for the study, the White House Office of Management and Budget (OMB) ordered the deletion of questions about whether VDTs might cause stress, a key issue considering the pace of much data entry work.

NIOSH plans to study the pregnancies of 2,000 telephone directory assistance operators who use VDTs at Bell South Corp. and compare them with those of 2,000 AT&T operators who do not use VDTs [CW, Jan. 14, 1985].

In an interview earlier this month, Teresa Schnorr, an epidemiologist who is directing the study, described the deleted portions as "critical." These portions would have investigated concerns that VDTs might affect a woman's ability to conceive or may cause miscarriages that occur so early in a pregnancy that they are not noticed. Bell South opposed those portions of the study in a critique submitted to NIOSH and the OMB, Schnorr said.

Many observers had hoped the NIOSH study would end the debate over clusters of miscarriages and birth defects reported by women using VDTs. Last year, a report by the U.S. House of

See **PREGNANCY** page 70

Betts is Computerworld's Washington, D.C., correspondent, and Ludlum is senior editor, management.

U.S. West boosts OA links

Holding company seeks postdivestiture solution

By David A. Ludlum

DENVER — U.S. West, the regional telephone holding company for 14 western states, has embarked on a program of integrating a slew of disparate computer systems in an effort to improve internal communications and reduce costly use of paper.

The job entails linking office automation hardware and software from IBM and Wang Laboratories, Inc., as well as machines from Digital Equipment Corp. and Unix systems running on boxes from several other vendors.

Paul Malkoski

The effort stems from a corporate drive to improve communications by allowing users of the incompatible equipment that has been installed over the years to talk to each other and receive memos via electronic mail.

The unification of the systems by U.S. West, which operates Mountain Bell, Pacific Northwest Bell and Northwestern Bell, is in part a response to organizational realities generated by the breakup of the Bell system.

"Since divestiture, we've been taking a more universal approach to problem solving, particularly in office automation," said Paul Malkoski, an assistant staff manager with Mountain Bell's Business Information Services department.

As a by-product of improving communications, the company aims to stem the tide of paper streaming through its offices by 25% this year. It estimates usage of 35.8 million pieces of paper a year at a cost of $45.8 million, a volume it attributes in part to the dictates of regulation and divestiture.

Half of the paper reduction is to come from the expansion of electronic mail, which emphasizes broadcasting memos as well as transmitting messages among individuals. Memos are being distributed through electronic bulletin boards and document data bases, Malkoski said.

The other half of the reduction is to come through new record management systems, including a computer-assisted retrieval system from Eastman Kodak Co., and through changing workers' attitudes toward the use of paper.

Separately, U.S. West's Human Re-

See **U.S.** page 69

Expos bring technology in-house

By David A. Ludlum

Pressed for time and faced with a steady barrage of computer prodoct announcements, some information systems managers have taken vendors by the horns by inviting them to in-house miniature exhibitions.

Such an event, called a technology day by some, is one of a variety of methods that information systems managers use to keep up with rapid-fire technological change while attending to their other myriad duties.

"The problem is keeping abreast of technology," says Ronald Price, information systems operations manager at Polaroid Corp. of Cambridge, Mass. "Technology day came about as a result of vendors coming in with different products and new releases. I said, 'Gee, this is crazy.' "

At the Gillette Co. of Boston, where similar events are held, manager of office systems Joseph J. Calabresi says he started holding technology days for a selfish reason: "I just haven't the time anymore."

The idea is "to get problems and solutions together," Calabresi says.

By inviting the office systems vendors around which Polaroid has standardized — Wang Laboratories, Inc., Digital Equipment Corp. and IBM — the camera compa-

See **EXPOS** page 69

INSIDE

INSTANT ANALYSIS

"You see the information center positioning itself as an information broker, and that's a very powerful position."

— Eric Greenberg, director of surveys for the American Management Association

MANAGEMENT MEMO

Strategies: Hyatt tests terminals; firms employ ergonomics

Hyatt Corp. is experimenting with using information technology to enhance accommodations at its Hyatt Regency Hotel in Cambridge, Mass. The hotel installed terminals for an in-house videotex system in deluxe rooms on a floor for business travelers and outside elevators on other floors.

The system, developed by Cambridge Technology Center, Inc. (CTC), uses AT&T 3B computers and 510 terminals and a telephone with touch-screen dialing. It offers information on hotel facilities and local dining and entertainment.

After a two-month trial, CTC removed the system to improve the software. The terminal was not designed for public use, which caused some users to lose their way, said CTC President Howard Kolodny.

CTC is developing a new read-only memory and expects the system to be back in service in "a month or so," Kolodny said. In the future, it might access external information such as stock quotes, news and flight information, he added.

Feedback from Hyatt guests has been wonderful, said Susan Conway, the hotel's director of sales. Other hotels have expressed interest in the system, and CTC is negotiating an agreement regarding it with AT&T, Kolodny said. He added that the system may be appropriate for other settings such as corporate visitor centers and office building lobbies.

■

U.S. West, the regional telephone holding company for 14 states (see story this page), may try to capitalize on its experience with information technology to go into a new line of business — **trading securities**.

The Denver-based company has filed waivers with the U.S. Department of Justice seeking permission to enter the securities business as well as the consumer electronics business, with a focus on computers.

U.S. West's knowledge of communications is a factor in its interest in securities, said Don Johnson, the company's director of public information. "We certainly know the business of information distribution. Our experience would serve us well if we chose to get into that area," he said.

But filing the waiver "doesn't necessarily mean we will," Johnson said. The company wants to be prepared if it decides to go ahead. He confirmed that it is "certainly not afraid" to acquire another company to go into the securities business.

■

Ergonomic features for VDTs are provided by about three-fourths of the companies that responded to a member survey by the Data Processing Management Association.

Among the most common features

See **MEMO** page 70

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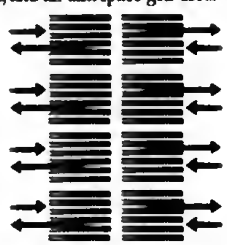

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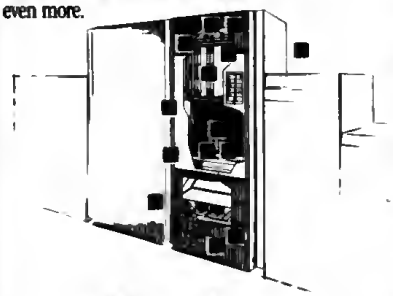

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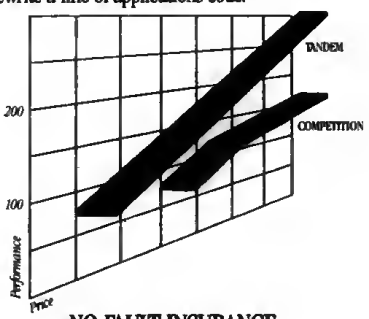

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TANDEMCOMPUTERS

U.S. West boosts OA links

From page 67

sources department is experimenting with telecommuting, observing about 100 employees in the Denver and Phoenix areas who are doing most of their work from home. An official of the department declined to elaborate on the experiment.

U.S. West's office automation systems include about 15 multinode local networks that serve roughly 20,000 terminals operating from about 150 host computers. There are 14,000 electronic mail users.

The company recently consolidated its Denver-area operations through construction of a new headquarters building, a move it used to kick off its integration effort by installing a broadband, coaxial cable network.

"It pointed the way to what we wanted to get," which was a vast wide-area net linking U.S. West computers in an area from the state of Washington to Arizona, Colorado and Minnesota and in offices in Washington, D.C., Malkoski noted.

The Denver-area network, which U.S. West built in-house, links 7,500 terminals and computers from seven vendors, both in the new building and others within a seven-mile radius. It includes switches that allow reconfigurations without moving lines and voice cables that run alongside data lines.

The network ties together the three predominant office automation and operating system environments at U.S. West — IBM Professional Office Systems (Profs) operating on VM, Wang Office running on VS and AT&T Unix System V operating on several brands of hardware.

U.S. West is "going to put less emphasis" on another environment — DEC's All-In-1 operating on VAX/VMS. It has relatively few of the systems and wants to avoid the aggravation of building specific gateways for them, Malkoski said. It will continue to use the DEC computers, porting Unix office automation systems to them.

"It's not that we don't think DEC is a good and valued vendor," Malkoski said. "We are removing All-In-1 from the picture, not DEC. It's more a tactical decision than anything else."

In building its wide-area network, the company is integrating the systems within each environment before attempting to tie them together. Integration of individual environments should be finished during the last quarter of this year, Malkoski claimed. The bridges between environments are expected to be done by the first quarter of next year.

U.S. West required each network to have a standard directory of electronic addresses, a file transfer format, directory updating and consistent software revision. The single biggest technical challenge has been integrating the user directory systems, Malkoski noted.

One hurdle has been resistance from vendors that are not eager to help U.S. West use other vendors' products, he said. "In some ways we're at the mercy of some vendors. They're protecting their own turf. IBM doesn't want to tell you how to integrate Profs into Wang Office because they want to sell you more Profs," Malkoski said.

In the future, U.S. West will standardize purchases of office automation equipment around the three environments, selecting the one that offers the best solution for the problem at hand, Malkoski said.

Expos bring tools in-house

From page 67

ny allows more of its technical staff to get a look at the products, Price says.

Polaroid surveyed its users on the types of products they wanted to see. It also asked vendors to demonstrate how their equipment relates to Polaroid's applications and to discuss future directions, Price says.

Holding a technology day can help avoid the need for Polaroid employees to travel to exhibits, he adds.

The event is useful to the vendors because they get to talk to a number of Polaroid users in one place, Price says. Polaroid's only costs have been for wiring, overnight security for the products and refreshments.

At Gillette, various vendors interested in displaying products are invited to do so as a group. An advantage of that is monitoring which vendors users are exposed to, Calabresi says. Information systems managers decide which vendors show their wares on the basis of the corporation's standards.

Gillette also tries to keep its nontechnical personnel abreast of technology by holding another type of event, also called a technology day, that is an annual full-day conference at a Boston hotel featuring outside speakers. The company also puts out a newsletter, "Information Technology News."

Not all information systems managers say they are enamored of technology days.

"I'm not sure that would prove anything. There's always a fudge factor involved when the vendors are trying to sell their wares," says Peter Lowber, assistant director of the Bureau of Systems Policy and Planning for the Commonwealth of Massachusetts.

The Commonwealth must avoid such contacts with vendors after a request for proposals has been issued in order to not run afoul of ethical guidelines, he notes.

Pregnancy and VDTs

From page 67

Representatives' Subcommittee on Health and Safety [CW, Sept. 16] called the NIOSH study vital and said its results could have far-reaching effects in reducing the fears of pregnant women using VDTs.

At recent House hearings, the Communications Workers of America (CWA) denounced the OMB action, charging it damages the credibility of the study.

The OMB, which controls government studies involving questionnaires under the Paperwork Reduction Act of 1980, initially rejected the NIOSH study proposal on grounds that it contained technical design flaws [CW, Feb. 24].

NIOSH resubmitted the proposal, and the OMB gave it conditional approval.

A June 6 letter by James B. MacRae Jr., chief of the OMB's reports management branch, said the questions on stress and other topics should be deleted because there was insufficient evidence linking them to reproductive problems. "They [the questions] therefore have no practical utility. In addition, they impose unnecessary burdens on respondents, and would add to the costs of conducting the study and data analysis," the letter said. MacRae also objected to questions about fertility, stating that measuring the effect of VDT exposure on fertility is not the purpose of the study.

Critics say the OMB made the changes at the behest of Bell South, which is concerned that it may be singled out for adverse publicity, but the OMB has denied the charge.

The CWA protested that the OMB's criticisms were strikingly similar to those of Bell South. David E. LeGrande, the union's director of safety and health, said he believes the OMB "basically was told what direction to take by Bell South and then used its letterhead to sign onto it."

> ***The OMB initially rejected the NIOSH study proposal on grounds that it contained technical design flaws.***

At a hearing held by Rep. Ted Weiss (D-N.Y.), the representative expressed concern that the OMB was meddling in a scientific study. Philip Landrigan, director of occupational medicine at Mount Sinai Medical Center in New York and former director of the NIOSH VDT study, testified that the OMB's action as an "unwarranted intrusion into the scientific authority of the agency."

NIOSH Director J. Donald Millar, when asked by Weiss what he thought of Bell South's end run around his agency, responded that he was "not real fond of it."

Millar said he understands that industries affected by sensitive NIOSH studies may try to revise, delay or kill the studies.

An OMB spokesman acknowledges that the office was aware of the Bell South concerns, but says the OMB also independently concluded that the study design was flawed.

When the study was first proposed more than two years ago, NIOSH planned to have both a retrospective study, looking at past pregnancies of VDT users, and a prospective study, following future pregnancies.

However, the prospective study has been dropped because, NIOSH officials said, it is increasingly difficult to find a control group of women who do not use VDTs.

Dr. William Halperin, chief of the NIOSH industrywide studies branch, said the telephone companies appear to be switching more employees to VDT use. He said it seems unlikely the prospective study will be done.

MANAGEMENT MEMO

MEMO from page 67

are detachable keyboards, used by 81% of the respondents; adjustable backrests on chairs, used by 71%; adjustable-height chairs, used by 78%; and swiveling monitors, 65%.

Managers who were surveyed also said they pay attention to vision problems, with 61% claiming to use glare-reducing filters for screens.

Slightly more than half put blinds or shades on windows near VDTs, and 88% buy terminals with brightness controls. But only 18% provide lighting for documents.

The survey shows that fewer than half the companies consult workers on implementing new technology or on revising work routines because of new technology — 40% and 48%, respectively.

■

Participative management is on the decline in data entry, while job rotation has become more popular, according to a recent survey by the Data Entry Management Association of Stamford, Conn.

The number of member organizations with participative management declined to 24% from 37.5% last year, according to the survey. In 1984 the portion was 35%, and in 1983 it was 43%.

Meanwhile, the portion of respondents with job rotation programs grew to 70% from 63% last year.

The driving forces behind most data processing professionals' careers are challenge or self-esteem, according to another survey by the Data Processing Management Association.

The survey reported 36% of respondents are motivated by challenge and 33% by self-esteem. Salary and career enhancement were each cited by 15%.

The survey found that U.S. information executives earn an average of $42,760 per year and that 59% feel they are "sufficiently paid" compared with managers who have similar responsibilities in other fields.

■

Executives waste 7.4% of their time looking for things that have been misplaced, according to an independent survey of vice-presidents and personnel directors sponsored by Accountemps of New York.

Based on a 40-hour week, that figure adds up to three hours a week and four workweeks a year of lost time, the firm said. Respondents were from the 1,000 largest U.S. corporations.

Perhaps that helps account for the heavy work load top executives take home. A similar study for Accountemps' parent firm, Robert Half International, Inc. of Jericho, N.Y., put the load at 10.5 hours a week.

— David Ludlum

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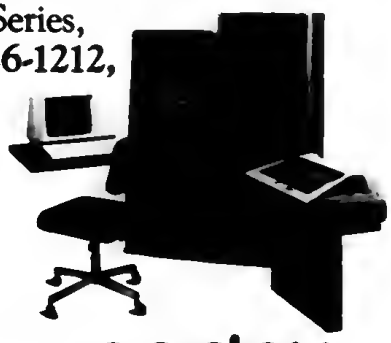

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CALENDAR

AUGUST 24-30

The Third International Congress on Advances in Non-Impact Printing Technologies. San Francisco, Aug. 24-28 — Contact: Society of Photographic Scientists and Engineers, 7003 Kilworth Lane, Springfield, Va. 22151.

Fault Tolerant Computing. Santa Cruz, Calif., Aug. 25-29 — Contact: Karin Poklen, Institute in Computer Science, University of California Extension, Santa Cruz, Calif. 95064.

Interconnect '86. San Mateo, Calif., Aug. 26-28 — Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

Information Systems Assessment. Noordwijkerhout, the Netherlands, Aug. 27-29 — Contact: Stichting Informatica Congressen, Paulus Potterstraat 40, 1071 DB Amsterdam, the Netherlands.

AUG. 31-SEPT. 6

International Federation for Information Processing Congress '86. Dublin, Sept. 1-5 — Contact: International Federation for Information Processing Congress '86, 44 Northumberland Road, Dublin 4, Ireland.

Fourth Annual Office Automation Society International Conference. Chicago, Sept. 2-6 — Contact: Sue Pickard, OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

The Desktop Publishing Conference. San Francisco, Sept. 3-6 — Contact: Seybold Seminars, 6922 Wildfire Road, Malibu, Calif. 90265.

Project Management Systems. Minneapolis, Sept. 3-5 — Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held Sept. 22-24 in Boston, Sept. 29 to Oct. 1 in Philadelphia and Oct. 22-24 in Cincinnati.

Federal Computer Conference. Washington, D.C., Sept. 3-5 — Contact: Ben Hughes, Federal Computer Conference, Box N, Wayland, Mass. 01778.

Telemarketing/West. Los Angeles, Sept. 3-5 — Contact: Doug Shreve, The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

National Canadian Systems 3X Users Show. Toronto, Sept. 4-5 — Contact: Elodia Thomas, c/o The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

SEPTEMBER 7-13

1986 Electronic Printer Conference. Boston, Sept. 7-10 — Contact: Jean O'Toole, CAP International, Inc., One Snow Road, Marshfield, Mass. 02050.

System 1022/1032 Users Conference. Burlington, Mass., Sept. 7-10 — Contact: System 1022/1032 Users Group, c/o Software House, 1000 Massachusetts Ave., Cambridge, Mass. 02138.

Planning for Network Integration. Nashville, Sept. 7-10 — Contact: Southeastern Telecommunication Association, P.O. Box 901, Richmond, Va. 23207.

How to Design and Implement Bar Code Systems. Detroit, Sept. 8-9 — Contact: Nancy Loerch, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Tutorial Week Boston '86. Cambridge, Mass., Sept. 8-12 — Contact: Martez A. Camilleri, Director of Tutorials, IEEE Computer Society, 1730 Massachusetts Ave., Washington, D.C. 20036.

Entity Modeling: Techniques and Application. Washington, D.C., Sept. 8-10 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Technical Update Conference — 86. Anaheim, Calif., Sept. 8-10 — Contact: Security Pacific Audit Services, Suite 208, 11565 Laurel Canyon Blvd., San Fernando, Calif. 91340.

NCC-Telecommunications Conference. Philadelphia, Sept. 8-10 — Contact: NCC-Telecommunications, American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

Quality Assurance Institute's Seminars on Quality Data Processing. Toronto, Sept. 8-12 — Contact: QAI, 9222 Bay Point Drive, Orlando, Fla. 32819.

Writing Procedures, Policies and Documentation. Austin, Texas, Sept. 8-12 — Contact: Laurel Lewis, Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154.

43rd FID Conference and Congress. Montreal, Sept. 8-18 — Contact: FID 43rd Conference and Congress, C.P. 1144, Succursale Place Desjardins, Montreal, Que., Canada H5B 1B3.

National Capital Datapoint User Group Meeting. Arlington, Va., Sept. 9 — Contact: Margaret Valavanis, OSP/WHS/DCOAR, Room 1C730, The Pentagon, Washington, D.C. 20301.

Computing in the 21st Century. Bloomington, Minn., Sept. 9-10 — Contact: Charles Babbage Institute, University of Minnesota, 103 Walter Library, 117 Pleasant St. S.E., Minneapolis, Minn. 55455.

Satellite Communications Users Conference 86. Las Vegas, Sept. 9-11 — Contact: Satellite Communications, 6530 S. Yosemite St., Englewood, Colo. 80111.

Midcon/86. Dallas, Sept. 9-11 — Contact: Midcon 8110 Airport Blvd., Los Angeles, C.f. 90045.

1986 Intelli, ent Buildings Conference and Expoeltion. Atlanta, Sept. 9-11 — Contact: Bryson Asso-

ciates, 162 Tower Place, 3340 Peachtree Road N.E., Atlanta, Ga. 30025.

Corporate Electronic Publishing Systems IV: A Conference and Show. Boston, Sept. 9-11 — Contact: Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

Real-Time Operating Systems: A Hands-On Workshop. San Diego, Sept. 9-12 — Contact: Yolande Amundson, Integrated Computer Systems, P.O. Box 3614, 5800 Hannum Ave., Culver City, Calif. 90231. Also being held Oct. 28-31 in Boston and Nov. 11-14 in Palo Alto, Calif.

Second European Simulation Congress. Antwerp, Belgium, Sept. 9-12 — Contact: The Society for Computer Simulation, c/o Ghislain C. Vansteenkiste, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

Southwest Idaho Chapter of the Data Processing Management Association's Annual Computer Show. Boise, Idaho, Sept. 10-11 — Contact: Jerry Morelan, Publicity Chairman, Southwest Idaho Chapter of the Data Processing Management Association, Boise State University, College of Business, 1910 University Drive, Boise, Idaho 83725.

Devlin Associates, Inc. Tenth Annual Disaster Recovery Planning Conference. Atlantic City, Sept. 10-12 — Contact: Devlin Associates, 430 Exton Commons, Exton, Pa. 19341.

Token-Ring Network & Application Program Interfaces. Palo Alto, Calif., Sept. 11-12 — Contact: Token-Ring Network & Application Program Interfaces Seminars, Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held Sept. 25-26 in New York.

Dataquest, Inc. Conference. San Diego, Sept. 11-12 — Contact: Computer Storage Industry Service, Dataquest, 1290 Ridder Park Drive, San Jose, Calif. 95131.

Optical Storage and Retrieval. Hyannis, Mass., Sept. 11-12 — Contact: International Optical Telecommunications, 720 Main St., Hyannis, Mass. 02601.

SEPTEMBER 14-20

CADRE — An Applied Data Research Users Conference. Nashville, Sept. 14-18 — Contact: Allen Haggar, Director of Client Relations, Applied Data Research, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Bypass: The Second Wave. New York, Sept. 16 — Contact: Jon Boroshok, Conference Registrar, The Eastern Management Group, Four Century Drive, Parsippany, N.J. 07054.

Canadian Office Machine Dealers Association/Candex. Montreal, Sept. 18-19 — Contact: Roy Whitsed, Candex Conference, Inc., 47 Lakeshore Road E., Mississauga, Ont., Canada L5G 4L7.

SEPTEMBER 21-27

National Retail Merchants Association's 28th Annual Retail Information Systems Conference. Anaheim, Calif., Sept. 21-24 — Contact: J. Joseph Miller, Director of Retail Standards and Technology, National Retail Merchants Association, 100 W. 31 St., New York, N.Y. 10001.

PSMJ CADD Managers Roundtable. Hyannis, Mass., Sept. 21-26 — Contact: Anita Stasiowski, PSMJ Roundtables, 10 Midland Ave., Newton, Mass. 02158.

Eighth Annual Lasers in Graphics/Electronic Publishing in the 80's Conference. Anaheim, Calif., Sept. 21-29 — Contact: Lasers in Graphics, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

"C" Programming with Style and Discipline. Milwaukee, Sept. 22-24 — Contact: John T. Snedeker, Center for Continuing Engineering Education, College of Engineering & Applied Science, University of Wisconsin — Milwaukee, 929 N. Sixth St., Milwaukee, Wis. 53203.

Space Tech '86. Orlando, Fla., Sept. 22-25 — Contact: Society of Manufacturing Engineers Public Relations, Box 930, One SME Drive, Dearborn, Mich. 48121.

Lasers in Automotive Manufacturing. Detroit, Sept. 23-24 — Contact: Mary Dombrowski, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

International Videotex Industry Exposition and Conference. New York, Sept. 23-25 — Contact: Susan LeDonne, Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06905.

Computer Aided Publishing '86 Exposition and Conference. Washington, D.C., Sept. 23-25 — Contact: Computer Aided Publishing Association, Suite 200, 90 W. Montgomery Ave., Rockville, Md. 20850.

Artificial Intelligence and Advanced Computer Technology Conference/Exhibition. Wiesbaden, West Germany, Sept. 23-25 — Contact: Tower Conference Management Co., 331 W. Wesley St., Wheaton, Ill. 60187.

EDI Training Session. Arlington, Va., Sept. 25-26 — Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036.

The Fourth Annual NCR Users Eastern America Conference. Atlantic City, Sept. 25-26 — Contact: Jack Hibberd, ECUO Treasurer/Convention Publicity Chairman, c/o AOR, Inc., P.O. Box 429, Willow Grove, Pa. 19090.

Robot Applications for Automotive Manufacturing. Detroit, Sept. 25-26 — Contact: Mary Dombrowski, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

The Association for Women in Computing's Fifth Annual Conference. St. Louis, Sept. 26-28 — Contact: Association for Women in Computing Conference '86, 407 Hillmoor Drive, Silver Spring, Md. 20901.

NEW PRODUCTS

DEC Q-bus, Unibus get color images

Peritek Corp. of Oakland, Calif., has introduced its VCX-Q/U color graphics board for Digital Equipment Corp. computers.

The single board, which costs $5,895, is reportedly able to create images 24 planes deep, with an independent alphanumeric overlay. The VCX-Q/U board can display any of 16 million different colors at any moment, giving the user immediate access to virtually all hues discernible to the human eye, according to Peritek.

VCX-Q/U is quad-height size, configurable for either DEC Q-bus or Unibus computers. Principal applications for the graphics board, according to a Peritek spokesman, include sophisticated imaging, process control, simulation and presentation graphics.

The graphics display is said to consist of 512 by 512 pixels, with the color of each pixel being determined by 8 bits each for red, greep and blue. Each 8-bit set is generated by an independent frame buffer and look-up table, permitting maximum flexibility in color selection.

The independent memory-mapped alphanumeric overlay reportedly consists of 50 lines by 80 characters. With this, the user has a choice of 64 character colors and 64 background colors, all independent of the graphics colors. The character set is stored in random-access memory and is user-programmable. VCX-Q/U has two video controllers, one for graphics and one for alphanumerics, which permit each display to be operated independently.

The board comes with a composite sync input, which is said to accept an internal signal to synchronize the board's operation with peripheral equipment. A direct port, independent of the computer's bus, enables an external device to operate directly on the board's registers and memories, according to a Peritek spokesman.

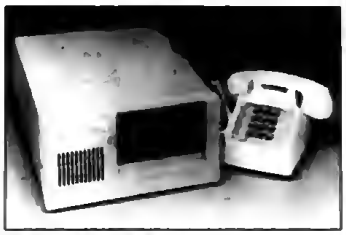
Software available for the VCX-Q/U includes test routines, initialization routines and a micro-level subroutine library for C language and Fortran, the vendor stated.

V-Mail supervises messages

Brooktrout Technology, Inc. of Wellesley Hills, Mass., has unveiled its V-Mail 220 voice messaging system, which is priced at $9,900 per unit and is said to be capable of handling up to 100 users.

The V-Mail 220, a computer-based unit connected to the user's telephone system, digitally records, stores and plays back voice messages. According to the vendor, the V-Mail 220 is accessible 24 hours a day from any telephone in the country to allow users to direct the unit to record, route and retrieve messages. This service is said to help eliminate "telephone tag," to ensure that messages are delivered accurately and to protect the privacy of messages.

V-Mail 220 reportedly allows the user to send the same message to a number of people simultaneously. The system also reminds the user of any messages, forwards messages to another telephone number at a user-determined time or to a third party and lets the user review, revise and edit phone messages before sending them. With V-Mail 220, users can also identify caller and time of message, review previously saved messages, send messages normally or flag messages for urgent delivery and check to see if previously sent messages have been received.



Brooktrout's V-Mail 220

The system can be configured as an open system in which anyone can call in and leave private messages, or it can be used as a closed system in which use is restricted to assigned users.

The messaging system has four major components: a microcomputer, two speech I/O channels, a 20M-byte, 5¼-in. Winchester disk drive and multitasking control software.

Each of the V-Mail 220's I/O channels handles one telephone line. The cards connect directly to an existing telephone system and can digitize and play speech, decode Touch-Tones and eliminate pauses. The system can store up to 1½ hours of messages and can be expanded to 3½ hours by adding another disk

Genicom unveils Quiet printer

Genicom Corp. of Waynesboro, Va., has added the 3410 Quiet dot matrix printer to the company's 3000 family of printers.

The Genicom 3410 Quiet is said to feature multiple mode printing, high-duty cycle and a noise level of lower than 55db. The 3410 Quiet is priced at $2,645.

According to a Genicom spokesman, the 3410 Quiet prints 400 char./sec. in draft mode and 120 char./sec. in near-letter-quality mode. At 18 and 10 char./in., the 3410 Quiet prints 244 and 136 columns, respectively.

The printer reportedly works with all popular personal computers and comes with a Centronics Data Computer Corp. parallel and RS-232C serial ports. With standard IBM graphics protocol, the 3410 Quiet is said to print high-resolution, dot-addressable graphics up to 144 by 144 dot/in. According to Genicom, 16 national character sets and IBM character sets 1 and 2 are also standard.

Up to six copies of paper can be accommodated with a choice of either rear or bottom feeding. An adjustable six-pin push tractor plus upper friction pinch rollers are used when paper is fed through the back of the printer. Optional automatic sheet feeders and single or dual bins are available.

Genicom also offers the 3410 printer, an identical version of the 3410 Quiet, although it does not include the sound reduction package. The 3410 printer is priced at $2,450.

INSIDE

"The #1 place to recruit qualified computer professionals nationally is Computerworld."

Robin Schwartz
Employment and
Employee Relations Manager
McCormack & Dodge
Natick, MA

Robin Schwartz is Employment and Employee Relations Manager for McCormack & Dodge, a software company based in Natick, Massachusetts. She is responsible for recruiting people for the company's home office as well as its seven regional offices across the country. And earlier this year when Robin was looking for software applications sales and support people, she chose to run an ad in Computerworld.

"I had numerous openings for positions across the country. From a cost-efficiency standpoint, Computerworld seemed like the logical choice," says Robin. *"But before finalizing my decision, I did a little investigating. I talked to our sales managers here at McCormack & Dodge — and they all agreed. The #1 place to recruit qualified computer professionals nationally is Computerworld. To keep in touch with what's going on in the industry, people have to read Computerworld,"* she explains.

McCormack & Dodge is enjoying national visibility as a result of the ad, but, more importantly, Robin is quite pleased with the responses. *"My people were right. We placed the ad in the beginning of the year and received tremendous response via our two-day hot line (800 number). And since we are still getting resumes, Computerworld obviously has a long life cycle through its pass-along circulation,"* she adds.

"The quality of the responses has made our ad placement more than worthwhile," concludes Robin. *"The professionals responding to our ad are experienced, not just job changers. We are getting in touch with just the people we need to reach."* In fact, according to Robin, *"Quite a few of the positions are already filled. Thanks to Computerworld!"*

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Robin.

For all the facts, call Al DeMille, National Sales Manager, at (617) 879-0700.

COMPUTERWORLD

375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171/(617) 879-0700

A PUBLICATION OF CW COMMUNICATIONS

SOFTWARE & SERVICES

Applications packages

Autodesk, Inc. has released **Autocad Version 2.5** for the IBM RT Personal Computer.

Version 2.5 of Autocad runs under AIX, IBM's enhanced Unix operating system. It will take advantage of the PC RT's unrestricted access to up to 4M bytes of random-access memory to offer fast regeneration for large drawings. Additionally, it will handle programs written in Autolisp, the interactive programming language written into Autocad.

Autocad 2.5 on the IBM RT PC is priced at $2,750.

Autodesk, 2320 Marinship Wsy, Sausalito, Calif. 94965.

MCBA, Inc. has ported its **accounting and distribution software packages** to the AT&T 3B family of computers.

The software packages available include accounts payable, bill of material processor, customer order processing, payroll purchase order and receiving, master scheduling and material requirements planning, according to the vendor.

Features found in each package include an optional security system that provides access privileges for each user, the ability to use a variety of terminals and provisions that alert the user to and allow recovery from data file I/O errors.

Prices range from $1,500 to $3,000 for object code only and $2,000 to $6,000 for source code licenses.

MCBA, 425 W. Broadway, Glendale, Calif. 91204.

Cosmic has announced the availability of the **Plaid** computer-aided design (CAD) program.

Plaid is a three-dimensional CAD system for interactively constructing and displaying sets of complex geometric models. Polygons are constructed explicitly by coordinates or graphically with either terminal cross hairs or a digitizer. Solid models are constructed by combining or rotating the polygons. Users may view the assemblies from arbitrary viewpoints in both wire frame and hidden-line renderings, with or without perspective.

Plaid is written in Fortran 77 for use on Digital Equipment Corp.'s VAX VMS computer. A 10-year license costs $6,000.

Cosmic, University of Georgia, Computer Services Annex, Athens, Ga. 30602.

Precision Visuals, Inc. has announced the **Picsure Plus** data display system.

Picsure Plus offers fast start-up for new and infrequent users, with on-line tutorials and instant Help. Users can produce line, pie and bar charts, data tables, scattergrams and illustrations with single-button responses to menu prompts.

Picsure Plus combines multiple images into a single chart and automatically sizes and positions text and sets margins. Additional features reportedly allow users to merge images created with other Precision products and keep track of saved charts and data.

Picsure Plus costs $20,500 on a Digital Equipment Corp. VAX 8200 or VAX-11/780.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

Languages

Sun Microsystems, Inc. has added **Modula-2** to the programming languages for its Sun-2 and Sun-3 workstations.

Said to be an alternative to C, Modula-2 is suited for large application projects in areas such as computer-aided manufacturing. Modula-2's type checking and system-level access capabilities make it suitable for producing systems software and embedded systems.

Modula-2 on Sun's workstations is priced at $2,000.

Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043.

Utilities

Tektronix, Inc. has announced its **Plot 10 Tekniviews** software.

Tekniviews reportedly provides window management functions such as pop-up menus, multiplane windows and vertical and horizontal scroll bars to Tektronix's 4111 computer display terminal and 4120 series color graphics workstation.

Tekniviews also runs under Digital Equipment Corp.'s MicroVMS and on Microvax II workstations and VAX/VMS computers.

Tekniviews costs $995 for the workstation version and $1,995 for the VAX version.

Tektronix, P.O. Box 1000, Wilsonville, Ore. 97070.

■

Structured Software Systems, Inc. has introduced **SDF200**, a language enhancement that adds a disk directory format to the Basic and Pascal operating systems for Hewlett-Packard Co.'s Series 200 and 300 desktop computers.

By adding SDF200 to existing operating systems, single-workstation users are said to gain the advantages of the Structured Directory Format without the expense of acquiring a shared resource manager controller.

SDF200 costs $500.

Structured Software Systems, 1072 Irick Road, Mount Holly, N.J. 08060.

Data base management systems

Groton Database Systems, Inc. has introduced **GDS/Galaxy**, a relational DBMS for distributed data bases and transaction processing.

The GDS/Galaxy system is said to provide fast, reliable data base access in complex multiuser environments. It runs on the Digital Equipment Corp. VAX and Microvax and on microcomputers from Sun Microsystems, Inc. and Apollo Computer, Inc.

The GDS/Galaxy ranges in price from $7,000 to $50,000.

Groton Database Systems, 150 Westford Road, Tyngsboro, Mass. 01879.

MICROS

Systems

Toshiba America, Inc. has introduced the **T1100 Plus**, an enhanced version of its IBM-compatible portable personal computer.

The laptop comes with two 3½-in., 720K-byte disk drives, 256K bytes or 640K bytes of memory, parallel and serial ports, an optional 300 to 1,200 bit/sec. modem and a new keyboard layout. Also included are a clock/calendar and interfaces for a red-green-blue and monochrome composite monitor.

The T1100 Plus with 256K bytes of memory costs $1,999. With 640K bytes of memory, it costs $2,399.

Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680.

Software application packages

Westminster Software, Inc. has announced the **Pertmaster Project Management System**.

The system is composed of three integrated software programs. The programs are Version 6.0 of Pertmaster, Pertplotter and Keeping-Tabs, a summary interface. The system runs under Microsoft Corp. MS-DOS.

With a capacity for 2,500 activities, the Pertmaster Project Management System costs $1,695; the 1,500-activity version costs $1,495.

Westminster Software, 2570 El Camino Real, Mountain View, Calif. 94040.

Software utilities

Imagimedia Technologies, Inc. has released **Portacad**, a utility said to facilitate transporting data between computer-aided design (CAD) systems.

According to the vendor, Portacad allows users of two-dimensional CAD systems, such as Autodesk, Inc.'s Autocad, to port their files to the vendor's Microcad for processing in 2-D space and vice versa. Portacad enables users working on a micro, mini or mainframe system to take material quantities directly from computer data.

Portacad costs $250.

Imagimedia Technologies, P.O. Box 210308, San Francisco, Calif. 94121.

Software enhancements

KEA Systems Ltd. has introduced **Version 2.6** of its **ZstemPC-VT100** software, designed to provide IBM Personal Computers with Digital Equipment Corp. VT100 terminal emulation.

Version 2.6 includes optional BIOS keyboard handling, a random-access memory-resident keyboard handler and IBM PC-DOS printer handling. Also included is support for VT640 remote-controlled invocation of the ZstemPC-4014 companion package and for PC-DOS Version 3.2.

ZstemPC-VT100 costs $150.

KEA Systems, #412-2150 W. Broadway, Vancouver, B.C., Canada V6K4L9.

■

Ken Orr & Associates, Inc. and **Nastec Corp.** have released **Documentorr Version 2.1**, linking Documentorr's computer-aided software engineering capabilities to Ken Orr & Associates' Structure(s) automated diagramming and Cobol-generation functions.

Version 2.1 uses pop-up menus customized to users' needs. Users can select diagrams and execute graphic editing commands such as expand, shrink and copy.

It costs $6,900.

Ken Orr & Associates, 1725 Gage Blvd., Topeka, Kan. 66604.

Communications

IBM has introduced **IBM Series/1-PC Connect**, a Series/1 licensed program that runs on an IBM Personal Computer, Personal Computer XT or AT.

The program is said to support the Series/1-to-PC Channel Attachment feature, a high-speed connection between a Series/1 and a PC. It provides PCs on the IBM PC Network or the Token-Ring network access to Series/1 disks and printers via the IBM Netbios interface.

IBM Series/1-PC Connect requires Realtime Programming System Version 7.1 or IBM Series/1 Event-Driven Executive Communications Facility Version 2.1.

It costs $400.

IBM, Old Orchard Road, Armonk, N.Y. 10504.

Printers/ Plotters/Peripherals

Random Corp. has announced the **Colleague portable terminal**.

The Colleague is an 8-lb portable terminal with a 25-line by 80-char. enhanced LCD display, a full travel keyboard and an internal 300 to 1,200 bit/sec. modem.

The Colleague can be interfaced to equipment through a standard RS-232C, 75 bit/sec. to 9.6K bit/sec. serial port. It features 20 programmable channels with 16 programmable function keys per channel.

The Colleague terminal costs $995.

Random, 581 Northland Blvd., Cincinnati, Ohio 45240.

Board-level devices

Information Systems Division of **Toshiba America, Inc.** has introduced its **Dual emulation** (DE) and **Down-line loadable** (DLL) type font expansion board kits.

The DE kit gives users the ability to utilize the full IBM extended character set. The DLL kit allows users to download disk-based type fonts to the printer from any IBM Personal Computer or compatible.

The P351 DE kit costs $99, the P341 DE and DLL kit, $199 and the P321 DLL kit, $99.

Information Systems Division, Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680.

COMMUNICATIONS

Controllers

Distributed Logic Corp. has introduced its **Model CQ1610** async controller.

The Model CQ1610 can reportedly be used to multiplex up to 16 RS-232C data channels to Digital Equipment Corp. LSI-11, MicroPDP-11 or Microvax computers. The controller reportedly provides full DEC DHV11 modem control on all channels.

The CQ1610 is software compatible with DEC DHV11 drivers and offers software-selectable transmission rates and character formats. CQ1610 offers data rates from 50 bit/sec. to 38.4K bit/sec. on all 16 channels.

The Model CQ1610 controller costs $1,600.

Distributed Logic, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806.

Voice/data communications

Dialogic Corp. has announced its muitiline voice product **Dialog/40.**

Dialog/40 reportedly provides telephone management features as well as record and playback, Touch-Tone decoding and Touch-Tone dialing. A single Dialog/40 is said to be able to support the interface and servicing of four telephone lines concurrently. Software support for Dialog/40 includes subroutines for line management, Touch-Tone response and dialing options.

Dialog/40 requires one expansion slot in an IBM Personal Computer, Personal Computer XT, AT or compatible.

The Dialog/40 costs $1,195.

Dialogic, 60 Baldwin Road, Parsippany, N.J. 07054.

Protocol converters

May-Craft Information Systems, Inc. has announced its **May-Craft 52 Local** protocol converter.

The May-Craft 52 Local protocol converter is said to allow up to seven ASCII devices to be connected to a standard twin-axial IBM System/34, 36 or 38 port. ASCII devices can be attached directly or remotely through an asynchronous modem.

The base unit is available in two models: Model 1 is a one-port nonexpandable unit, and Model 2 is expandable to up to seven ports and comes equipped with a single RS-232 port.

The Model 1 base price is $1,450.

May-Craft Information Systems, 4312, Beltwood Pkwy. S., Dallas, Texas 76244.

Software

Tektronix, Inc. has announced the **Protocol Microlink** software package.

Protocol Microlink is said to provide an interconnection among Tektronix 4132 and 6130 workstations and Digital Equipment Corp.'s Microvax II workstations running MicroVMS Version 4. The software is compatible with the Transmission Control Protocol/Internet Protocol standard.

Protocol Microlink reportedly implements networking protocols, which makes it possible for users of Microvax II, 4132 and 6130 workstations to exchange text and data files.

Protocol Microlink costs $2,995.

Tektronix, P.O. Box 1700, Beaverton, Ore. 97076.

Multiplexers/Modems

GTE Supply has enhanced its **GTE Trailblazer** modem.

The latest release of GTE Trailblazer reportedly has increased speeds from 10K bit/sec. up to 18K bit/sec. The Trailblazer is said to adapt to any line condition by automatically adjusting its speed by no more than 100 bit/sec. at a time. The modem features internal error correction, real-time line analysis and remote access. It operates with any asynchronous device with a serial RS-232 interface and plugs into a standard AC wall outlet.

The GTE Trailblazer costs $1,995 for the IBM Personal Computer card and $2,396 for the stand-alone modem. Upgrades are available for $99.

GTE Supply, 6226 Wiley Post Way, Lakeside Plaza 2, Salt Lake City, Utah 84116.

Racal-Vadic, Inc. has introduced its **4850PA** modem.

The 4850PA 4.8K bit/sec. modem is said to provide AT&T Bell Laboratories 208 and CCITT V.27 compatibility, four integral automatic dialers and full front-panel control. With the addition of application drivers to the communications software, the modem is said to perform the control and automatic-dialer functions.

An alphanumeric display and keyboard integrated into the front panel allow local reconfiguration, diagnostics and option configuration.

The 4850PA costs $1,296.

Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95035.

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For more information
SETA Office 804-746-3195

Local-area networks

Avanti Communications Corp. has released **B8ZS encoding**, an enhancement to the company's Series 2300 Local Area Data Distributor said to improve data transmission throughput and reliability.

The B8ZS encoding feature reportedly provides clear channel transmission at rates of 56K bit/sec. to 3.152M bit/sec. The B8ZS feature identifies consecutive data zeros and substitutes a pattern that is a bipolar violation. The Series 2300 identifies this pattern and passes along data zeros to the communication device.

The B8ZS option for the Series 2300 costs $250.

Avanti Communications, Aquidneck Industrial Park, Newport, R.I. 02840.

Test equipment

Systems Strategies, Inc. has announced **EX3278**, software for testing the communications functions of IBM's 3270 series computer products and systems.

EX3278 is a package of Cobol CICS transaction programs that tests and exercises the facilities of 3278 display terminals, Models 2 and 5, 3279-2A and -2B color terminals and 3287 printers.

The EX3278 license fee is $12,000.

Systems Strategies, 225 W. 34th St., New York, N.Y. 10001.

Auxiliary equipment

Dataprobe, Inc. has announced its **HD-RJ45S-24-8** modular jack distribution system.

The HD-RJ45S-24-8 is said to interconnect four 50-pin telephone connectors with 24 eight-wire modular jacks. According to the vendor, each connector distributes six four-pair circuits to RJ45-type modular jacks.

The HD-RJ45S-24-8 modular jack distribution system is priced at $215 each.

Dataprobe, 110 W. Palisade Blvd., Palisades Park, N.J. 07650.

SYSTEMS & PERIPHERALS

Turnkey systems

NCR Corp. has introduced their **NCR 6760 Tower-Check** system.

The Tower-Check system is said to provide processing for items from an intelligent reader and sorter base. A typical configuration includes a 12-pocket reader and sorter; 2M-byte Bell Laboratories Unix-based processor with integrated disk; an NCR 6430 band printer and capture media.

The cost of a typical configuration is $137,355.

NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479.

Data storage

DY-4 Systems, Inc. has introduced its **DVME-718** small computer systems interface (SCSI) controller.

The DVME-718 is said to be based on an 8-MHz Motorola, Inc. 68010 CPU. The module includes a direct memory access controller, two byte-wide memory sockets, direct random-access memory and full-feature SCSI interface.

DVME-718 costs $1,989.

DY-4 Systems, Suite 202, 1475 S. Bascom Ave. Campbell, Calif. 95008.

■

Telebyte Technology, Inc. has released **Telebyte TDX 45** and **TDX 75** small computer system interface (SCSI) versions of two 9-track ½-in. tape drive subsystems.

The Telebyte TDX 45 and TDX 75 SCSI versions are said to be able to communicate with a wide range of high- and low-performance single- and multiple-host systems.

Buffered data transfer rates are up to 1.25M bit/sec. Both tape drives feature ANSI-compatible dual-density support of 800 and 1,600 bit/in.

The TDX 75 SCSI version costs $7,400, and the TDX 45 costs $6,400.

Telebyte Technology, 270 E. Pulaski Road, Greenlawn, N.Y. 11740.

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Our Pinwriter® P5XL printer has changed forever the way people look at dot matrix printing.

It's the first and only dot matrix that can use a letter-quality multistrike film ribbon—the same ribbon used in typewriters and letter-quality printers, such as our Spinwriter.® Which means for the first time in computer history you can produce important letters and documents with crisp, black, true letter-quality printing without sacrificing speed or graphics capability.

Dear Mr. Black:

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Fast, black letter-quality printing will be the primary reason many people will buy a P5XL printer. But there are plenty of other good reasons. In fact, it's the most versatile printer ever created for personal computers.

It can use an optional ribbon to print seven other colors plus black. And it has the best graphics resolution of any impact printer you can buy, due in part to our advanced 24-pin printhead. Plus it can print more typefaces automatically than any other dot matrix printer. And it's quiet and fast.

You can also expect a P5XL printer to turn out millions of characters before it will need service because it has the highest reliability rating in the industry. And there's a nationwide network

C&C Computers and Communications

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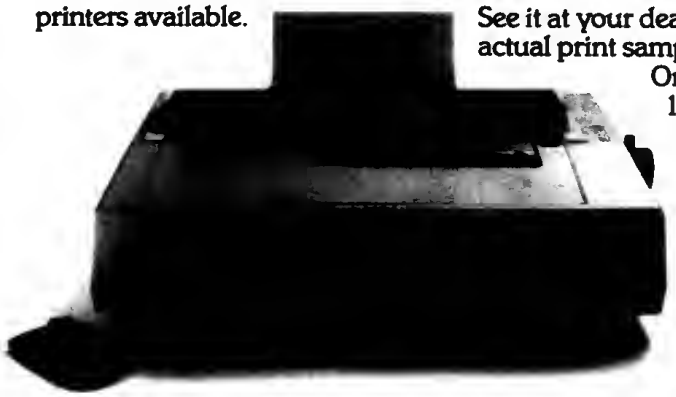
of NEC Customer Engineering Service Centers to take care of maintenance.

Now, while the Pinwriter P5XL performs a little black magic, you won't have to go in the red to buy it.

The Pinwriter P5XL is the latest addition to the most advanced and extensive family of 24-pin printers available.



See it at your dealer or for an information package that includes actual print samples, call 1-800-343-4418 (in MA 617-264-8635).

Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

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NEC Information Systems, Inc.

EXPECTATIONS

The new ADDS 2020 will raise your expectations about all display terminals. You've always expected readable data. Now you can have high resolution, larger characters, 80/132 columns, 14" green, amber or white display, line graphics for highlighting, and variable-speed smooth scroll. There is, however, one thing you should not expect from the 2020—screen flicker. A unique 70Hz refresh produces a flicker-free display that you can read all day.

You've never expected 44 programmable keys with 88 modes and over 2500 characters of non-volatile memory to support them. Never expected it because the ADDS 2020 is the first terminal to give it to you.

The ADDS 2020 keyboard gives you a legend strip and the satisfying feel of solid quality. And if you like your PC keyboard, keep it. With the ADDS 2020 you can use IBM PC* compatible keyboards, even IBM's.

Greater expectations: The 2020 provides Lotus*-like menu bar assistance for function keys and applications; available desk accessories include a clock, calendar, calculator and telecommunications; a printer port for either serial or lower-cost parallel printers; and bell volume programmable from the keyboard or host. And, as superior as this new terminal is, it is still fully compatible with ADDS, Hazeltine, Lear Siegler, TeleVideo, Wyse and many other terminals.

Beyond the 2020

There's a new ADDS behind the ADDS 2020. With still more inventive products to come like the new "picture perfect" 3220. So call 1-800-231-5445 today.

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Company _____

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*IBM is a registered trademark of International Business Machines Corporation.

*Lotus is a registered trademark of Lotus Development Corporation.

Printers/Plotters

Facit, Inc. has introduced its **C5500** printer.

The C5500 is said to interface with both micro and minicomputers and to handle graphics and correspondence printing. It prints draft-quality correspondence at 250 char./sec. and near-letter-quality at 60 char./sec.

Other features include fanfold or cut-sheet feeding, print parameter switching and color flexibility. It allows users to set their own print parameters, such as font style, form length and interface protocol, by responding to questions posed by the printer. The C5500 can use a four-color ribbon or a black ribbon.

The C5500 costs $1,595.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

Power supplies

Emergency Power Engineering, Inc. has introduced the **Mainframe Power Center** (MPC).

The MPC reportedly isolates, distributes and monitors AC power to systems such as the IBM 3090 mainframe family. According to the vendor, with the MPC, electric installation of a typical mainframe can be completed in less than half a day.

One MPC has connections for as many as four high-current loads. In addition, between 42 and 126 power poles are available to distribute power to any combination of smaller single-phase and three-phase loads, such as disk drives, printers or other peripherals.

The MPC costs from $9,000 to $20,000, depending on features and kVA rating.

Emergency Power Engineering, 3580 Cadillac Ave., Costa Mesa, Calif. 92626.

■

Displex, Inc. has introduced an **uninterruptible power supply** (UPS), said to protect against power blackouts, brownouts, spikes and surges.

The UPS is said to eliminate the need for dedicated lines by guarding against interference and hazards related to poor grounding. It eliminates both common-mode and normal-mode noise and spikes that can garble computer data and pose safety and reliability problems.

The unit features sine-wave output, zero transfer, short circuit protection, high noise immunity, quiet operation and up to 20 min. of backup time at full load provided by maintenance-free batteries.

The unit is available in power ratings of 1.25 kVA, 2.50 kVA and 6.20 kVA.

The system is priced from $3,140.

Displex, One Alexander Place, Glen Cove, N.Y. 11642.

Auxiliary equipment

Proximity 2000, a security access control system, has been introduced by **Cardkey Systems**.

Said to provide hands-free operation by reading concealed tags or cards with special coding and design over a 12-in. to 16-in. distance, Proximity 2000 controls access to a secure area for as many as 65,000 individuals. The system can operate as an on-line, off-line or stand-alone device and can also monitor up to eight supervised alarm contacts.

The Proximity 2000 system, which includes a D-400P Terminal/Controller, costs $2,850.

Cardkey Systems, 20660 Bahama St., Chatsworth, Calif. 91311.

PRICE REDUCTIONS

American Computer & Peripheral, Inc. has announced price reductions on their **American 88** (XT) **Basic system**, **American 88 Perfect system**, the **American 286-A** (AT) **Basic system** and the **American 286-A Perfect system** computer systems.

The American 88 Basic system with 128K bytes of random-access memory (RAM) and Microsoft Corp.'s MS-DOS costs $750; the American 88 Perfect system with 640K bytes of RAM costs $3,150; the American 286-A Basic system with 512K bytes of RAM costs $2,450; and the American 286-A Perfect system with 512K bytes of RAM costs $4,850.

American Computer & Peripheral, 2720 Croddy Way, Santa Ana, Calif. 92704.

■

Tamp Computer Systems, Inc. has reduced the price of its **Disaster Recovery System** for IBM Personal Computers and compatibles.

The Disaster Recovery System is said to consist of a six-phase approach for making a disaster recovery planning project and contains tools necessary for the six phases. Included are sample questionnaires, interoffice memos and external letters.

The Disaster Recovery System now costs $7,500.

Tamp Computer Systems, 1732 Remson Ave., Merrick, N.Y. 11566.

Rexon Business Machines has reduced the prices of its **RX55**, **RX105**, **RX205** and **RX405** multiuser microcomputers.

The entry-level RX55 with 512K bytes of memory, four serial ports and two parallel ports, a 25M-byte hard disk drive and a 60M-byte ¼-in. cartridge streaming tape drive is now priced at $9,990, according to the vendor.

The RX105, with the same features as the RX55 but with 51M bytes of disk storage, now is priced at $10,990.

The RX205 with an 85M-byte Winchester disk now costs $12,990, and the RX405, which features a 227M-byte disk drive and an eight-slot card cage, now costs $23,990.

Rexon Business Machines, 5800 Uplander Way, Culver City, Calif. 90230.

COMPUTER INDUSTRY

Section begins on page 110

M&D switches to independent units, aims to triple revenue

Divisions to handle own products, profits

By Charles Babcock

NATICK, Mass. — While large companies such as IBM have used independent business units to achieve specific corporate goals or to function in a niche area of corporate operations, McCormack & Dodge Corp. is one of the first large software companies to reorganize its entire business around that approach.

M&D is in the process of reorganizing into five independent business units in an attempt to triple its revenue by 1991 and minimize turnover, especially among its skilled programming staff.

The Natick-based applications software company, part of Dun & Bradstreet Corp., passed the $100 million mark in revenue last year after 17 years in business. With 1,300 employees, it has taken the reorganizational step in an attempt to maintain its entrepreneurial spirit, says Frank H. Dodge, president, chief executive officer and cofounder of the firm.

Each of the five independent units will be responsible for its own profit and loss and for its own product line, including development, marketing and support. A companywide sales force will continue to handle direct sales, but each business unit will be responsible for training the sales force in its product line, Dodge says.

The concentration of so much responsibility in each unit will force more decision-making power down to the level of "middle managers, who are crucial to the company's success," Dodge adds.

CEO Frank H. Dodge

In addition to improving business performance, the new organization is designed to increase an employee's sense of participation in the company, says M&D Vice-President for Human Resources Loretta S. Henry.

She claims the firm's 20% annual turnover rate is substantially below what she says is the industry average of 30% to 35%. M&D wants to keep it that way, if not push its rate lower.

"You agonize over your superstars," she says. "You want to keep talent, not lose it. You want to let them have an impact."

One noted "technical superstar" who left M&D a year ago is Executive Vice-President John B. Landry, developer of the flagship Millennium accounting software series. Henry says the reorganization had "nothing whatsoever" to do with Landry's departure and that Landry was in the unusual position of being able to acquire his own company, Distribution Management Systems, Inc. of Lexington, Mass.

Annual turnover can be anywhere from 10% to 30% at a software products company, with an average tenure of 2½ years for software engineers, according to a spokesman for Robert Kleven & Co., a Lexington, Mass.-based placement office.

M&D's reorganization was designed in consultation with a cross section of 40 middle managers, according to Dodge. The group was asked to plan the transition as if "an alien spaceship had landed and captured the executive committee," he says.

The new business units at M&D will be as follows:

- Distributed systems, headed by John P. Birch, formerly vice-president of research and development. It will be responsible for developing products that distribute applications from mainframes to minicomputers and microcomputers.
- Applications tools, headed by Dean F. Redfern, formerly vice-president of information services. Its product line includes M&D's Millennium series, including fourth-generation development tool Millennium:SDT and Millennium:FYI, an on-line memo and electronic mail package.
- Financial systems, headed by David G. Todd, formerly vice-president of marketing and support. Its product line will include general ledger, accounts receivable, accounts payable and other financial applications.
- Human resource systems, directed by Henry P. Holland. Its product line will be human resource applications such as payroll and personnel management.
- Manufacturing systems, also under the direction of Holland, with responsibility for the PIOS manufacturing series. M&D will hire an executive who will report to Holland to manage the manufacturing systems operation, formerly Rath & Strong Systems Products, Inc., in Dallas.

Within each business unit is an account manager. The holders of this newly created position will be located geographically close to customers and serve as their contacts for product implementation and support.

How to know when your HP® 3000 needs more memory.

It's ironic, but the more things you add to increase your HP 3000's productivity, the more you can actually slow it down.

That's because all those upgrades and enhancements require additional main memory. And without it, your system becomes sluggish and less responsive.

Five common reasons why you may need more memory.

While there are many reasons why your system may need more memory, five of the most common ones are:

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2. Upgrading to a new revision of the MPE-V™ operating system, including U-MIT;
3. Adding or utilizing disk caching. Too often, information that should be in main memory ends up exiled to disk memory;
4. Moving up to HP's new enhanced Turbo-IMAGE™ or any other database management system;
5. Running software applications that "hog" your system's memory. These include HPWORD™ or other word processing programs... graphics packages like HPDRAW™ ... and spreadsheet packages such as VISICALC/3000.™

All of these additions to your system require varying amounts of additional main memory to maximize your HP 3000's performance and get the most out of your new software.

Add-in memory gives your system an instant boost in speed, performance and productivity.

The question then is, "Which memory boards should you choose?"

While your first response may be to call Hewlett-Packard, an even better response is to call EMC.

To start with, EMC offers you more memory sizes to choose from. 1MB, 2MB, 3MB and 4MB for Series 37 and 37XE. 1MB, 2MB and 4MB for Series 39 through 58. And 1MB and 4MB for Series 64, 68 and 70.

More importantly, every EMC add-in memory board comes with an *unconditional lifetime warranty*, the only one in the industry.

Our memory boards are designed with fewer components than HP boards. So they're inherently more reliable and consume less power. In fact, EMC was the very first company to manufacture high-density memory for the HP 3000.

Every single board we make undergoes 100 hours of rigorous testing and burn-in—including 24 consecutive hours of CPU qualification in our own dedicated HP 3000s.

As a result, unlike HP, we have *no maintenance charges* of any kind.

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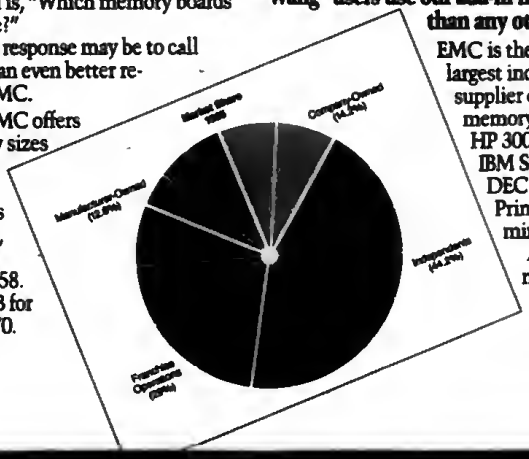
More HP, IBM,® Digital,® Prime® and Wang® users use our add-in memory than any other.



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EMC has just released an independent study that examines the effects of memory availability on HP 3000 performance.

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Fujitsu to offer U.S. vendors domestically produced disks

Japanese firm opens U.S. plant

By Jeffry Beeler

HILLSBORO, Ore. — Fujitsu Ltd.'s U.S. subsidiary recently opened a $30 million disk systems factory that soon will give Amdahl Corp. and other North American vendors their first domestic source of Japanese-designed storage products.

Although Fujitsu America, Inc. delayed the plant's formal dedication ceremony until Aug. 1, the facility has reportedly been producing 10½-in. disk subsystems since April.

Fujitsu President Yamamoto

To date, the products have gone mainly to the firm's OEM customers, the first of which was Portland, Ore.-based Sequent Computer Systems, Inc., according to Fujitsu America President Masaka Ogi.

But in approximately 15 months, the plant will also begin shipping 10½-in. storage modules to Amdahl, the U.S. reseller of Fujitsu's IBM-compatible mainframes, according to Wally Cox, the factory's director of manufacturing.

Relocating manufacturing sites

In the past, Fujitsu has always manufactured the modules in Japan and exported them to the U.S. But now, with the recent opening of its fifth U.S. manufacturing site, the Japan-based company for the first time is beginning to locate its disk systems assembly lines in the same countries where the products will be sold.

"Currently, only 25% of Fujitsu's total sales come from overseas," Fujitsu President Takuma Yamamoto told *Computerworld*. "In the future, we hope to expand our growth rate overseas so that the U.S. and other countries contribute a greater percentage to our overall revenue."

Currently, the Hillsboro site employs nearly 100 workers, all but a handful of them American.

It produces several hundred units per month exclusively for domestic consumption, according to Mike Gluck, senior vice-president for Fujitsu America's Storage Products Division.

Strengthen service, support

The decentralization of the parent company's disk systems manufacturing efforts is an attempt to strengthen Fujitsu America's service and support of its peripherals customers.

"When our disks are being shipped from Japan, we sometimes have trouble responding promptly to sudden increases in customer demand," Gluck said. "But by producing the equipment here in the U.S., we gain additional flexibility and can adjust our capacity to meet short-term production requirements."

Production, R&D site

The factory forms part of a 130-acre site that will ultimately hold six extra buildings. These buildings will house both manufacturing and research and development activities.

As additional production floor space gradually becomes available, the complex will likely broaden the scope of its manufacturing endeavors to include other kinds of storage modules aside from the 10½-in. disk units.

Some possibilities for future product emphasis include 8-in. disk and ¼-in. cartridge tape systems, Gluck said.

Uneasy truce in chip war

From page 110

an interesting test of the supposedly integral part the Japanese government plays in the private sector.

With all the political posturing that has followed the agreement, what has been glossed over is the overall semiconductor industry context. The commodity chip price war is essentially over, and the winners are the companies whose names end in a vowel.

In that context, the recent trade agreement is more like a postwar treaty than a landmark of cooperation. Whether the fate of the U.S. chip industry will look more like the ravaged Germany of the 1920s or the revitalized Germany of the late 20th century remains to be seen.

The touchiest part of the agreement is Japan's promise of increased U.S. access to its markets — reportedly a mandated market share increase from 8% to 20% in the next five years. That requires overcoming two intrinsic facts about the Japanese market.

First, the majority of semiconductors sold in Japan go not into the latest parallel processor, but into videocassette recorders, microwave ovens, calculators and the other consumer goods that made Japan, Inc. what it is today. American suppliers aren't making many chips for those products, since the Japanese cornered the market long ago.

The related second point is Japan's ingrained cultural predilection toward purchasing things Japanese. They have no need for "Park Your Dodge in Detroit" bumper stickers. Like business card exchanges and sake dinners, buying native goods is part of Japanese business ethos.

If Reagan, Nakasone and their trade emissaries can change that, so much the better; the prediction here is that they will not. U.S. semiconductor exports to Japan may improve to a degree. But one gets a strong feeling that there will be new trade skirmishes breaking out when 1991 rolls around and the U.S. market share looks well short of the targeted 20%.

And then the politicians will be out in force again.

FAA to halt purchases

From page 110

equipment is in place at our facilities and we need it. We can't get along without it."

Paradyne provides the FAA with modems, multiplexers, a network management system and related services, in order to implement the Data Multiplexing Network Project for improving air traffic control operations.

In December 1985, Paradyne was suspended from obtaining new or renewed government contracts after the company and some of its top officials were indicted by a federal grand jury for allegedly defrauding the Social Security Administration [CW, Dec. 23]. The defendants have vigorously denied the charges.

GAO auditors said they are not convinced the FAA should purchase more Paradyne equipment and urged the FAA to study alternatives to continuing its business dealings with Paradyne.

A new evaluation

Changing circumstances, such as the Paradyne suspension and pending litigation, warrant a new evaluation of the need to purchase Paradyne equipment, the GAO concluded.

Paradyne's suspension was triggered by criminal charges alleging that the firm won a $118 million contract for data communications equipment and terminals by misleading Social Security Administration officials as to the status and availability of the products.

At a key demonstration test, Paradyne used a Digital Equipment Corp. PDP-11 processor instead of the Paradyne P-8400 processor promised in the bid and covered the label with a Paradyne label without informing agency officials.

The Department of Justice earlier this month filed a civil suit against Paradyne to recover profits the firm obtained under that contract.

The Justice department plans to delay the civil proceeding until after the criminal trial.

Nixdorf ignites overseas vendors' hopes to enter U.S. market

W. German company scores retail contract

By Dennis Phillips
Computerworld International News Service

BONN — The recent signing of a $100 million contract between West Germany's Nixdorf Computer AG and a 400-store U.S. retail chain, reportedly Montgomery Ward & Co., may help open the door to the North American market for European software companies, industry analysts predict.

The very competitive price war for both hardware and standard software programs in the U.S. had many analysts fearing just the opposite trend. They expected U.S. companies would invade the European market. But now Nixdorf's success in winning a big contract "in the lion's den" gives European firms cause for optimism.

Top quality software, an installed service network and a cutthroat price combined to help Nixdorf grab the more than $100 million contract with the U.S. retail chain, according to insiders.

"From the hardware side, there's no reason to buy from Nixdorf," says a banking analyst, who asked to remain anonymous. "So if it's true they won the contract for their software, that puts a new light on things. Maybe European companies, and especially German ones, will have a greater impact in the U.S. now."

Nixdorf's software department now offers about 130 software programs, mostly developed in-house, for different applications.

'A complete solution'

"I think the European companies may have a competitive advantage as they offer a complete solution — hardware, software and service," says Hans-Joachim Grobe, consultant with management consultants Dieboldt Deutschland GmbH in Frankfurt.

While traditionally strong in the European and Asian banking sector, Nixdorf also installed a new retail point-of-sale (POS) program in Australia recently. The 45-store Myer retail chain in Australia ordered 2,250 POS terminals from Nixdorf at the end of 1985, according to Nixdorf spokesman Rolf Prey.

Developing the software for that system undoubtedly helped the West German firm in its bid for the U.S. contract. If the U.S. chain, like the Australian retailer, wants 50 terminals per store, it will require 20,000 POS terminals. Installation in the U.S. is to start in 1987.

Considering the downstream advantages for Nixdorf, the sales price was probably set with no profit margin at all, analysts suggest. Nixdorf confirms that the contract is split 50% for hardware and 50% for software and services.

Until now, Nixdorf has lost money in the U.S., investing heavily to set up its own sales and service offices in 100 U.S. cities [CW, July 7]. "We needed to get a customer to use this system, but without such a technical support system you can't win a major contract," Prey says. "First we had to invest. Now it will start to earn money in America."

Harris broadens CAD packages via acquisition

By Alan Alper

NEW YORK — Harris Corp. last week announced the acquisition of Scientific Calculations, Inc., a Fishers, N.Y.-based developer of electrical computer-aided design (CAD) software.

Harris said it acquired the privately held Scientific Calculations, which has sales of about $30 million, to broaden its portfolio of mechanical CAD products to include electrical CAD packages for the design of printed circuit boards and integrated circuits. Scientific Calculations' SCICADs printed circuit board design package is said to be used by approximately 70% of leading electronics firms, according to Harris.

James Oyler, senior vice-president of Harris's Information Systems sector, said the acquisition would enable the Melbourne, Fla., firm to become the only vendor offering its own range of mechanical and electrical CAD software packages.

"Users are beginning to need packages from various disciplines," Oyler said. "And, over time, demand will increase."

Scientific Calculations is essentially a software developer, but also markets turnkey, electrical CAD systems based on Digital Equipment Corp. hardware.

Oyler said Scientific Calculations will retain its name and operate under current management, led by President Paul Watkins.

The company will be part of Harris's Information Systems unit. Eventually, however, Scientific Calculations' sales, marketing and product development will be merged into the sector, he added.

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Novell will sponsor evening events for attendees and exhibitors at NetWorld, including a lively Mexican Fiesta in the Infomart Atrium on September 16.
And NetWorld will provide a forum for many local area networking industry experts to address important LAN issues. Scheduled speakers include representatives from IBM, Ashton-Tate, Novell, MicroAge, Security Pacific Automation Company and many others.

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Today there are over 300,000 NetWare users worldwide. And there are thousands of available products and services for NetWare-supported LANs. NetWorld 86 is the ideal place to bring NetWare users and purchasers together with NetWare VARs, OEMs, dealers, distributors, retailers, application software developers and members of the press.

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I Trade Resellers
Your Company's Main Business Activity
1 ☐ Computer consultant
2 ☐ Computer dealer/dist
3 ☐ Computer OEM
4 ☐ Office products dealer
5 ☐ Service vendor
6 ☐ Software developer
7 ☐ Systems house
8 ☐ Turnkey vendor
9 ☐ Value adder
10 ☐ Other (specify)

II Corporate Volume Buyers
Your Company's Main Business Activity
A ☐ Accounting firm
B ☐ Advertising
C ☐ Banking
D ☐ Communications
E ☐ Construction/Architects
F ☐ Credit
G ☐ Education
H ☐ Engineering
I ☐ Government/Military
J ☐ Hospital
K ☐ Hotel
L ☐ Industrial design
M ☐ Insurance
N ☐ Law office
O ☐ Management consultant
P ☐ Manufacturing
Q ☐ Publishing
R ☐ Real estate
S ☐ Research/Development
T ☐ Retail sales
U ☐ Securities broker
V ☐ Transportation (all)
W ☐ Utility
X ☐ Wholesale/Retail sales
Y ☐ Other (specify)

III Your Job Function
(Check main one only)
AA ☐ Accountant
BB ☐ Administrator
CC ☐ Consultant
DD ☐ Corporate officer
EE ☐ Creative arts (all)
FF ☐ Designer (all)
GG ☐ DP/WP manager/operator
HH ☐ Engineer (all)
II ☐ MIS Dir./Mgr.
JJ ☐ Programmer
KK ☐ Purchasing
LL ☐ Sales/marketing
MM ☐ Scientist
NN ☐ Securities financial analyst
OO ☐ Service technician
PP ☐ Systems analyst
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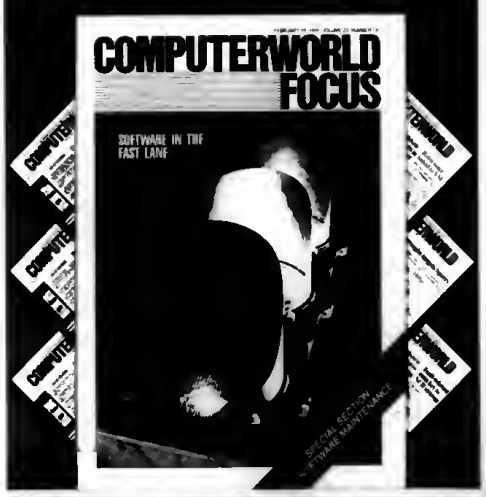
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This position also requires project management skills including experience with large scale D/P projects (62%), project methodology, project planning, implementation and tracking, and management of project team individuals.

Qualified individuals should possess a Bachelor's Degree or equivalent (MBA considered a plus).

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MIDDLE SOUTH SERVICES, INC. is currently involved in several projects including large scale IMS DB/DC systems development. The current hardware environment consists of (3) IBM 3090's, (1) 3083 MVS/XA, 4381 VM/CMS and Tandem.

Analyst/Programmer (Financial) - The position involves analysis and coding of medium to high complex tasks in support of our Property Accounting Management System.

This position requires at least 3 years of experience as an Analyst/Programmer in a large IBM mainframe environment. In addition to working knowledge of OS/JCL, COBOL, IMS/DB; previous experience in supporting financial applications is required. IMS/ADF experience is helpful but not required.

Analyst/Programmer (IMS DB/DC) - The position involves analysis and documentation of system requirements; extension of corporate data base designs to support new applications; development of IMS transactions using the TRANSFORM Applications Generator; design and development of field edit logic; and testing and debugging of IMS online programs. The position requires at least two years of experience in applications development using IMS DB/DC and TSO/ISPF in an MVS environment. Previous experience or training is desirable in the development of decision table specifications; data base design; and requirements analysis.

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Programmer Analyst. 40 hours/week, 8:00 a.m. - 5:00 p.m. $26,778/year. Job requires MS in Computer Science and 1 year experience as Programmer. Job also requires: 1) 2 grad courses in database, 2) 1 grad course in software system development, and 3) 1 grad course in analysis of computer algorithms. Job duties are: based on principles and techniques of database management system, design applications programming for insurance project. Consider user needs. Study existing outputs/reports to establish new online claim systems. Design and develop claims online system using COBOL, IMAGE database language, QUIZ, QTP, and QUERY on Hewlett Packard 3000 computers and IBM (or compatible) PC/XTs. Qualified applicants should send resume and verification of requirements to: 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #49886. Employer Paid Ad.

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Data Processing

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You are invited to send your resume with salary history and geographical preference to Employment, **SPERRY Integrated Business Systems, Systems Integration Division**, Dept BRIT 2, 1901 N. Moore Street, Suite 506, Arlington, VA 22209 **or call Toll Free (800) 233-7365.**

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TECHNICAL WRITER—To write and update Project Athena's user documentation set; work with faculty and staff to determine needs; participate in design of Athena's systems and services; test pre-release software. Bachelor's degree or equivalent experience and one year technical writing experience necessary. Strong "under the hood" technical background including knowledge of at least one programming language, computer editors and formatters. Experience in university setting, UNIX system, application area knowledge strongly desired. Writing samples required. (A86-740)

SYSTEMS PROGRAMMER/RELEASE ENGINEER—Will assist in planning and executing systems builds and installation of software. Will be responsible for separating bug reports between installation, configuration, design, or development errors. Special qualifications: Bachelor's degree or equivalent combination of education and experience is required. Three to five years of professional experience in systems programming is required. Individuals should have extensive experience with UNIX operating systems and C, Fortran and Lisp also desirable. Professional experience should include work in some of the following areas: source code control for large projects, system engineering, tuning of operating systems, and management of local area networks. Good communications skills are vital. (A86-711).

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Please send two copies of resume, referencing appropriate job number and writing sample as necessary to: Sally Hansen, MIT Personnel Office, E19-230, 77 Massachusetts Avenue, Cambridge, MA 02139.

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MIT

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PROJECT LEADER - PC SYSTEMS

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Works with corporate Data Processing group to develop communications network on multiple IBM System 38 systems. Is capable of assisting in the implementation of management systems for new telephone systems.

Applicants should have experience in traffic analysis, electronic mail systems, voice network management, data network configuration, and new system implementations.

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Businessland to buy Morris

By Alan Alper

Continuing its acquisition binge, computer retailing giant Businessland, Inc. last week agreed to purchase privately held Morris Decision Systems, Inc., a leading reseller to corporations in the New York metropolitan market.

Under terms of the deal, the purchase price, to be paid in Businessland common stock, will be based on Morris's closing financial statements. A Businessland spokeswoman said several hundred thousand shares of new Businessland stock would be issued to Morris shareholders. The deal is expected to close Sept. 3.

Businessland's proposed acquisition of Morris follows its recent takeover of Kansas City, Mo.-based Amerisource, a 28-outlet chain operating primarily in the Midwest. Earlier this year, the San Jose, Calif., firm attempted to acquire 36-store chain MBI, Inc., of Rockville, Md., but could not come to terms [CW, June 9].

Sought to be acquired

Morris sought to be acquired after recently deciding that it would have difficulty continuing to grow or attracting additional financing due to deteriorating market conditions, Morris President Jim Coane said.

"This was aggravated by price cuts made by all our major suppliers recently," he said. "IBM's moves in April on their workstations also made it difficult for us to add value by building up the hard disk drives."

Coane said Morris had been discussing a business combination with Businessland for a couple of years. "They embrace the same basic strategy — selling to corporations — that we have executed in the marketplace," he claimed.

Analysts last week said Morris appears to fit nicely with Businessland. "It looks like a fair match," said Seymour Merrin, an analyst with the Gartner Group, Inc. in Stamford, Conn. Merrin founded the Westport, Conn.-based chain Computerworks, Inc., which was acquired by Morris last November.

Reflects ongoing consolidation

The proposed acquisition reflects the ongoing consolidation within the computer retailing business. "The big companies have to get bigger," Merrin said. "They want more clout with their suppliers, and their customers want vendors who have more clout as well."

Coane agreed. "You have to make money on the buy side since it's hard to make any money on the sale side," he explained. "That comes only with purchasing power, which results only from buying in large volume."

The 6-year-old Morris, which operates three computer centers, has annual revenue of approximately $32 million. Businessland, which operates 99 outlets in 43 metropolitan markets, posted sales of $404 million in its fiscal year ended June 30.

If the acquisition is finalized, Morris' founder and Chairman, Anthony Morris, will become a corporate vice-president of Businessland, Coane said.

Despite skepticism, disk drive stocks can prove rewarding

ACTIVE ISSUES
Kathy Porteus

Investors are giving Winchester drive companies a raw deal, according to analysts.

In recent weeks, disk drive stocks such as Seagate Technology Corp. (SGAT — 12), Micropolis Corp. (MLIS — 16⅜), Maxtor Corp (MXTR — 14¾), Priam Corp. (PRIA — 2⅝) and Miniscribe Corp. (MINY — 6½) were particularly hard hit owing to negative investor sentiment toward technology.

Jean W. Orr, vice-president with Drexel Burnham Lambert, Inc., says, "Investors feel that component suppliers will be affected by continued sluggish demand for computers regardless of how affected they now seem."

Analysts say some drive companies currently trade below their price/earnings ratios of a year ago, despite improved fundamentals. An oft-cited example is Seagate, which is also recommended by most analysts who follow disk storage firms.

Seagate recentiy disclosed fourth-quarter and fiscal 1986 results that surpassed expectations. The company reported 1986 earnings of 72 cents per share on revenue of $460 million vs. last year's per-share earnings of 2 cents on $215 million in revenue.

"Seagate's margins were fantastic, its business mix showed real improvement, and such good numbers come in the wake of one of the worst slumps ever," says Steven Ossad, an analyst with L. F. Rothschild, Unterberg Towbin.

Yet Seagate is selling "at absolutely no multiple," according to Ossad, who estimates Seagate will earn $1 25 per share in fiscal 1987. Likewise, Orr says Seagate has been and continues to be a very good value.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

She estimates the company will earn $1.15 to $1.20 per share in the current fiscal year.

Why hasn't a stock like Seagate responded better to positive company developments?

"Disk drive stocks are always volatile and have been characterized by radical shifts in investor sentiment," Ossad explains. "Right now, nobody wants to believe that some of these companies are doing very well."

James Stone, an analyst with Shearson Lehman Brothers, Inc., laments that "investors do not understand the dynamics of the Winchester drive market." According to Stone, brand loyalty does indeed exist among OEM customers, and the market is still oriented toward product performance, quality and service.

Nevertheless, Stone says, the perception persists that this is a commodity market in which "customers will sell their mothers for a $5 difference in the price of a drive."

Stone says he believes Micropolis's stock, like Seagate's, is being held down by fear. "Investors are concerned that the industry's deep trouble three years ago could resurface in spite of four or five consecutive quarters of up earnings," he says. Stone estimates Micropolis will earn $1.75 per share in fiscal 1986, ending Dec. 31.

Both Stone and Ossad describe Priam as a very risky bet based on the company's new 190M-byte drive, which is still in pilot production. The company suffers from a weak core business and the reputation of delivering new products late.

But Ossad recommends purchase of Priam because it is a prudent speculation. Under 3, Priam appears to be selling $1.00 below book value, according to Ossad, and the company has $25 million to $27 million in cash and no debt.

Despite current investor resistance to Winchester drive companies, analysts maintain that the potential for a valuation increase exists. "People will inevitably discover," Ossad says, "that here is a group of stocks that are out of favor and doing much better than anybody really thinks."

Chip slump eases in spite of layoffs

From page 110

steady increase in the book-to-bill ratio from a low of .65 in January 1985, observers say AMD's layoffs were just a delayed reaction to the hard times of a year ago.

Kidder Peabody & Co. analyst Adam Cuhney said AMD's layoffs were in part the result of problems stemming from a loss of key sales and marketing people, declining research and development efforts and the firm's unsuccessful attempts to bring products developed in Sunnyvale, Calif., into production in its Austin, Texas, manufacturing facility.

AMD's no-layoff policy was often held up as an example of extraordinary management. But the plan backfired when stock prices began to slip. "They went out with a bold idea of holding on to their employees and trying to manage the way the Japanese manage," White said. "But they were clearly running counter to the trend, and their stock price suffered."

The chip industry clearly has yet to achieve the dramatic turnaround predicted by the SIA at the end of last year. That rebound never materialized because a turnaround must be market driven, and "there has just not been enough demand to warrant an uptorn," according to Michael Gross, analyst at Framingham, Mass.-based market research firm International Data Corp.

"There are no meaningful signs of an increase in demand for semiconductors from the computer sector," said W. J. Sanders III, AMD's president and chief executive officer.

Semicondoctor manufacturers will continue to record losses during the third quarter of this year, but the fourth quarter could bring a return to profitability, Gross said. An upturn will begin to show through in the first quarter of 1987, as purchases of communications and computer equipment increase.

Probst to retire; exec office forms

From page 110

cal to users, whether Sperry or Burroughs, that their concerns are addressed. That's why it is important that the new company has a Sperry presence at the top."

In a separate statement, Burroughs said a meeting is scheduled to be held Sept. 16 for shareholders to conclude the merger between the two companies.

Each share of Sperry common stock is expected to be exchanged for $30.60 principal amount of Burroughs 9.75% subordinated debentures and 0.918 of a share of Burroughs Series A convertible preferred stock.

Convergent reorganizes, cuts staff

SAN JOSE, Calif. — Confirming recent industry speculation [CW, Aug. 11], Convergent Technologies, Inc. last week announced a major reorganization that included the layoff of 500 of the company's 1,900 employees.

Convergent also reduced top management salaries by 10% in a related cost-cutting move.

The reorganization creates a new unit, Convergent Small Business Services, that will manage Convergent's push into turnkey systems in vertical markets.in the past year, Convergent has acquired or announced its intent to acquire vendors of turnkey systems in the legal, accounting and dealer and distributor markets.

The existing Convergent Technologies unit will maintain responsibility for the firm's current OEM and value-added reseller business. But President and Chief Executive Officer Paul C. Ely Jr. said Convergent is attempting to diversify away from what he called the grand-slam OEM deals, such as the workstation contract AT&T canceled earlier this year.

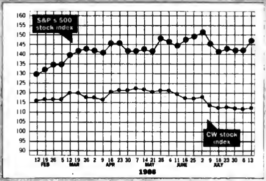
Ely called last week's layoffs "a direct result of the steep decline in our sales to AT&T."

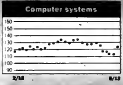
— Clinton Wilder

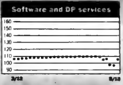
COMPUTER INDUSTRY

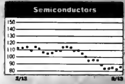
MITCHELL I. HAYES

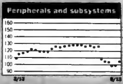
Computerworld stock trading index

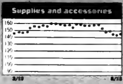












All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	8/6/86	8/13/86
Computer systems	111.6	**122.0**
Software and DP services	97.3	**106.1**
Peripherals and subsystems	99.3	**104.6**
Supplies and accessories	143.3	**145.5**
Semiconductors	81.6	**85.5**
Leasing companies	93.0	**102.0**
CW stock index	112.2	**113.4**
Standard and Poor's 500 stock index	141.6	**145.5**

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, AUGUST 13, 1986

COMPUTER SYSTEMS

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	8	4	4.25	-0.3	-5.9
O	ALTOS COMPUTER SYS	19	10	11.38	+0.6	+5.8
A	AMDAHL CORP	19	10	17.75	+0.4	+2.2
O	APOLLO COMPUTER INC	19	9	12.00	+2.0	+20.0
O	APPLE COMPUTER INC	39	14	35.00	+4.9	+15.7
N	AT&T	26	20	23.50	-0.5	-2.1
N	BURROUGHS CORP	72	52	71.25	+4.6	+6.9
O	C P T CORP	7	4	4.25	+0.0	-0.0
N	COMPAQ COMPUTER CORP	18	8	14.75	+1.1	+8.3
A	COMPUTER CONSOLES INC	12	6	8.63	+1.1	+15.0
O	CONCURRENT COMP CORP	25	1	13.25	+1.8	+15.2
N	CONTROL DATA CORP DEL	27	15	21.13	+0.3	+1.2
O	CONVERGENT TECH	14	8	6.13	-0.1	-2.0
N	CRAY RESH INC	100	44	85.75	+5.0	+6.2
O	DAISY SYS CORP	32	8	9.75	+1.3	+14.7
N	DATA GEN CORP	50	30	34.88	+3.4	+10.7
N	DATAPOINT CORP	9	5	7.50	+0.3	+3.4
N	DIGITAL EQUIP CORP	98	50	67.38	+7.6	+8.5
N	ELECTRONIC ASSOC INC	7	4	4.50	+0.8	+20.0
N	FLOATING POINT SYS INC	46	14	15.63	+1.1	+7.8
N	GOULD INC	38	15	17.88	-1.8	-8.9
N	HARRIS CORP DEL	38	22	27.88	+0.1	+0.5
N	HEWLETT PACKARD CO	48	29	42.13	+2.3	+5.6
N	HONEYWELL INC	87	59	88.38	+2.5	+3.6
N	IBM	162	122	134.00	+2.9	+2.2
O	IPL SYS INC	4	1	3.00	+0.3	+8.1
N	ITT CORP	60	32	53.50	+3.1	+6.2
N	M A COM INC	21	13	14.75	-1.4	-8.5
N	MATSUSHITA ELEC INDL LTD	100	49	83.50	+0.9	+1.1
O	MENTOR GRAPHICS CORP	21	11	14.13	+2.8	+24.2
N	MODULAR COMPUTER SYS	9	6	8.88	+0.0	+0.0
N	MOHAWK DATA SCI CORP	4	1	2.50	+0.8	+33.3
N	NBI INC	16	9	10.00	+0.6	+6.7
N	NCR CORP	57	31	54.25	+4.3	+8.5
N	PRIME COMPUTER INC	29	15	19.88	+0.4	+1.9
N	SPERRY CORP	76	46	75.63	+0.4	+0.5
O	STRATUS COMPUTER	29	15	21.25	+1.8	+9.0
O	SYMBOLICS INC	19	7	7.13	+0.3	+3.6
O	TANDEM COMPUTERS INC	39	13	38.38	+4.9	+14.6
N	TANDY CORP	45	32	36.13	+1.5	+4.3
N	TEXAS INSTRS INC	148	88	115.63	+12.0	+11.9
A	ULTIMATE CORP	35	11	17.50	+3.0	+20.7
A	WANG LABS INC	23	12	13.75	+0.5	+3.8
A	WANG LABS INC	23	11	13.50	+0.4	+2.9
N	XEROX CORP	72	46	56.63	+4.5	+8.8

SUPPLIES & ACCESSORIES

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER BUSINESS PRODS	37	25	30.00	-0.4	-1.2
N	BARRY WRIGHT CORP	25	17	19.50	+0.5	+2.6
A	DUPLEX PRODS INC	23	17	20.13	+0.0	+0.0
N	ENNIS BUSINESS FORMS INC	29	15	23.75	-0.3	-1.0
N	3M CO	115	74	112.00	+2.3	+2.1
N	MOORE LTD	29	18	24.83	-0.4	-1.5
O	STANDARD REGISTER CO	50	20	37.25	+0.0	+0.0
N	WALLACE COMPUTER SVCS	50	33	46.25	+0.3	+0.5

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER; S=SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & DP SERVICES

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	3	5.13	-0.1	-2.4
N	ADVANCED SYS INC	20	11	15.00	-0.8	-4.8
N	AGS COMPUTERS INC	29	14	18.13	+0.9	+5.1
O	AMERICAN MGMT SYS INC	20	8	17.25	-0.3	-1.4
O	AMERICAN SOFTWARE INC	15	9	12.38	+0.9	+7.9
N	ANACOMP INC	7	3	4.00	-0.5	-11.1
O	ANALYSTS INTL CORP	10	4	4.63	-0.1	-2.6
O	ASHTON TATE	34	10	26.50	+3.6	+15.8
O	ASK COMPUTER SYS INC	15	7	11.00	+0.9	+8.6
O	ASTRADYNE COMP IND	3	1	1.91	+0.5	+35.9
N	AUTOMATIC DATA PROC	39	18	33.25	+3.5	+11.8
O	COMPUTER ASSOC INTL INC	25	10	24.25	+1.8	+7.8
O	COMPUTER HORIZONS CORP	15	10	11.13	+1.0	+9.9
O	COMPUTER NETWORK TECH	10	2	6.81	+0.0	-0.0
N	COMPUTER SCIENCES CORP	40	20	38.00	+1.9	+4.7
O	COMPUTER TASK GROUP INC	19	12	11.75	+0.0	+0.0
O	COMPUTONE SYS INC	6	1	1.88	+0.0	+0.0
O	COMSHARE INC	13	9	12.13	-0.1	-1.0
N	CULLINET SOFTWARE INC	20	8	8.75	+0.9	+11.1
O	CYCARE SYS INC	17	10	12.00	-0.1	-1.0
O	DUQUESNE SYS INC	45	11	29.00	+0.5	+1.8
N	GENERAL ELEC CO	83	56	79.88	+3.4	+4.6
N	GENERAL MTRS CORP	50	33	[illegible]	+0.0	-0.0
N	GTE CORP	57	38	55.63	+1.0	+1.8
O	HOGAN SYS INC	12	4	10.38	+0.4	+3.8
O	INFORMATION SCIENCES INC	4	1	2.13	-0.4	-15.0
O	INFOTRON SYS CORP	23	12	12.50	+0.3	+2.0
O	KEANE INC	18	7	7.50	+0.0	+0.0
N	LOGICON INC	43	27	27.75	-0.3	-0.8
O	LOTUS DEV CORP	39	15	35.00	+8.0	+20.7
O	MANAGEMENT SCI AMER	18	8	14.50	+1.4	+10.5
O	MCI COMM CORP	13	8	7.75	-0.3	-3.1
O	MICOM SYS INC	23	10	11.00	-0.3	-2.2
O	MICRO PRO INTL CORP	4	2	2.44	+0.3	+11.4
O	MICROSOFT CORP	36	26	26.75	+2.0	+7.2
O	NATIONAL DATA CORP	29	11	18.50	+1.4	+7.9
O	ON LINE SOFTWARE INT	19	9	12.25	+0.5	+4.3
O	ORACLE SYS CORP	29	14	15.88	+1.0	+9.7
N	PANSOPHIC SYS INC	36	18	28.13	+1.5	+5.9
N	PLANNING RESH CORP	24	14	20.25	+0.0	+0.0
O	POLICY MGMT SYS CORP	24	15	17.50	-1.8	+11.1
O	PROGRAMMING & SYS INC	11	5	9.00	-0.3	-2.7
O	REYNOLDS & REYNOLDS CO	37	18	38.50	+3.8	+11.5
O	SCIENTIFIC COMPUTERS INC	9	4	4.25	+0.3	+6.3
O	SEI CORP	29	15	19.25	-0.5	-3.2
O	SHARED MED SYS CORP	41	29	34.13	-0.3	-0.7
O	SOFTWARE AG SYSTEMS INC	22	13	17.00	+0.0	+0.0
O	SOFTWARE PUBG CORP	10	5	5.50	-0.4	-6.4
A	STERLING SOFTWARE INC	21	7	17.88	+1.5	+9.2
N	UCCEL CORP	23	13	20.00	+0.5	+2.9
N	URS CORP	19	10	15.50	+0.3	+1.9
O	VM SOFTWARE INC	32	17	27.29	+3.0	+12.4

SEMICONDUCTORS

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	34	14	16.38	+1.8	+12.0
N	ANALOG DEVICES INC	29	14	17.00	+0.3	+1.5
O	ANALOGIC CORP	16	10	11.50	+1.3	+12.2
N	APPLIED MAGNETICS CORP	20	12	15.50	+0.8	+5.1
O	AVANTEK INC	24	16	17.38	+1.6	+10.3
O	HADCO CORP	7	4	4.83	+0.4	+10.4
O	INTEL CORP	32	19	20.00	+3.0	+17.6
O	MICRO MASK INC	8	2	3.00	-0.3	-7.7
N	MOTOROLA INC	50	29	38.88	+1.9	+5.1
N	NATIONAL SEMICONDUCTOR	16	9	9.25	+0.5	+5.7
N	TERADYNE INC	20	17	16.13	+0.5	+2.7

PERIPHERALS & SUBSYSTEMS

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	9	3	8.25	-0.3	-3.8
A	ANDERSON JACOBSON INC	3	2	2.25	+0.1	+5.9
O	AST RESH INC	33	11	10.88	-0.5	-4.4
O	AUTOTROL CORP	10	8	7.00	-0.5	-6.7
O	AVANT GRADE COMPUTING	9	3	3.25	-0.4	-10.3
O	BANCTEC INC	13	7	7.13	-0.1	-1.7
N	BOLT BERANEK & NEWMAN	48	28	41.88	+2.8	+7.0
O	CAMBEX CORP	2	1	1.00	+0.0	+0.0
N	CENTRONICS DATA COMP	8	4	7.88	+0.9	+12.5
A	CETEC CORP	9	6	6.25	+0.1	+2.0
A	COGNITRONICS CORP	9	3	3.38	-0.3	-8.5
N	COMPUGRAPHIC CORP	29	17	17.25	-0.9	-3.5
N	COMPUTERVISION CORP	19	9	12.75	+1.3	+10.9
N	CONRAC CORP	18	11	15.25	+0.6	+5.7
A	DATAPRODUCTS CORP	18	11	13.63	-0.3	-1.9
A	DATARAM CORP	18	5	9.13	+1.6	+21.7
O	DATA SWITCH CORP	9	5	6.13	+0.8	+14.0
O	DATUM INC	7	5	5.63	-0.3	-4.7
N	DECISION INDS CORP	15	9	8.88	-0.1	-1.4
O	ENDATA INC	8	3	5.75	+0.4	+7.0
O	EVANS & SUTHERLAND	27	16	21.38	-0.3	-1.2
N	FLOATING POINT SYS INC	46	14	15.93	-1.1	-7.8
O	GANDALF TECHNOLOGIES	9	5	6.25	-0.1	-2.0
N	GENERAL DATACOMM IND	15	8	10.25	+0.9	+9.3
N	HAZELTINE CORP	29	19	17.88	+1.0	+5.8
O	ICOT CORP	13	9	9.00	-0.1	-1.4
O	INFORMATION INTL INC	18	10	15.50	+0.4	+2.5
O	INTECOM INC	7	3	4.94	+0.2	+4.0
O	INTERLEAF INC	15	8	8.13	+0.1	+1.9
O	MEGADATA CORP	5	3	2.88	-0.4	-11.5
A	MSI DATA CORP	14	8	10.38	+0.3	+2.5
N	NASHUA CORP	28	12	27.13	+1.4	+5.3
O	NETWORK SYS CORP	26	10	12.50	+0.8	+6.4
N	NORTH AMERN PHILIPS CORP	48	32	39.75	+3.9	+10.0
N	NORTHERN TELECOM LTD	38	25	29.50	+0.9	+3.1
O	NOVELL INC	21	10	18.88	+1.6	+9.4
O	OMEX	1	0	0.38	+0.0	+0.0
N	PARADYNE CORP	13	9	6.63	+0.0	-0.0
A	PENRIL CORP	9	5	4.88	-0.3	-4.9
N	PLESSEY PLC	38	19	29.00	-0.5	-1.7
O	PRINTRONIX INC	15	11	12.13	+0.3	+2.1
O	QMS INC	19	6	14.50	+0.3	+1.8
O	RAMTEK CORP	7	2	6.00	+0.6	+11.9
N	RECOGNITION EQUIP INC	17	9	11.25	-0.1	-1.1
N	SANDERS ASSOC INC	63	29	59.88	+0.0	+0.0
O	SCAN TRON CORP	24	12	18.50	+2.3	+13.8
N	SCIENTIFIC ATLANTA INC	15	9	8.63	+0.0	+0.0
O	SEAGATE TECHNOLOGY	14	5	12.00	+0.8	+6.7
N	STORAGE TECHNOLOGY	7	1	2.63	-0.1	-4.5
O	SUN MICROSYSTEM INC	20	11	14.50	+2.3	+18.4
A	T BAR INC	7	5	9.13	-0.1	-2.0
A	TAB PRODS CO	15	10	14.50	+0.3	+1.8
O	TANDON CORP	8	3	3.50	+0.4	+12.0
A	TEC INC	9	4	5.50	+0.5	+10.0
N	TEKTRONIX INC	65	47	58.88	+3.1	+5.8
O	TELEVIDEO SYS INC	4	2	2.50	-0.1	-4.8
N	TELEX CORP	69	40	55.50	+1.3	+2.3
N	TIMEPLEX INC	24	14	15.63	+0.9	+5.8
N	TITAN CORP	12	5	9.63	+0.9	+8.9
O	VISUAL TECHNOLOGY INC	2	0	0.50	-0.1	-11.0
O	WYSE TECH	19	7	15.63	+2.1	+15.7

LEASING COMPANIES

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	25	12	20.00	+2.3	+12.7
N	CONTINENTAL INFO SYS	12	5	10.13	+0.6	+6.9
O	FINALCO GROUP INC	5	3	3.13	+0.0	+0.0
O	PHOENIX AMERN INC	8	2	3.75	-0.1	-3.2
O	SELECTERM INC	12	5	5.75	+0.4	+7.0
N	U.S. LEASING	46	32	41.50	+2.3	+5.7

COMPUTER INDUSTRY

INSIDE

INSTANT ANALYSIS

"The onslaught of Asian competitors ... has irrevocably changed the semiconductor industry. Our world has changed, and to survive, we too must change."

— **W. J. Sanders III, president and CEO, Advanced Micro Devices, Inc., on his company's first layoffs since 1974**

Chip slump said to be easing despite layoffs, slow orders

By Maura McEnaney

Declining orders and a leading manufacturer's break with a no-layoff policy were grim news for the U.S. semiconductor industry last week. But while news of layoffs would seem to indicate further deepening of the worst slump in the industry's history, analysts say they believe the chip business is inching its way to recovery.

Semiconductor billings for the three-month period ending in July slipped to their lowest point in eight months, according to statistics from the Semiconductor Industry Association (SIA). The SIA's monthly book-to-bill ratio fell to 0.97, marking the first time in six months the indicator dropped below 1.0. The latest book-to-bill ratio indicates that for every $100 worth of products shipped, manufacturers received $97 worth of new orders.

"The industry is better off today than it was a year ago," said analyst Edward White of E. F. Hutton & Co. "Orders are up, and prices are firming. I think we're closer at hand to a general economic improvement in the industry. The book-to-bill is basically a summer lull. There's no chance the book-to-bill will be above 1.0 in August."

Hand in hand with the recent book-to-bill figures came news of 200 layoffs at Advanced Micro Devices, Inc. (AMD), which had been adhering to a no-layoff policy since 1974. Effective last Friday, AMD, citing a "murderous competitive environment," dismissed 200 employees with less than one year's service. Further layoffs could occur after AMD's second-quarter results are reported in October.

In the previous week, Intel Corp. announced the closing of an offshore plant and the layoff of 1,320 workers.

Although the layoffs paint a gloomy picture for an industry that had shown some improvement of late, including a

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FAA to halt Paradyne purchases

By Mitch Betts

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) last week disclosed that it will not buy additional data communications equipment from Paradyne Corp., the Largo, Fla.-based firm that was suspended from government contracts because of fraud charges.

The FAA, which had obtained an exemption from the governmentwide suspension of purchases from Paradyne, was under increasing pressure from the House Committee on Government Operations and the General Accounting Office (GAO) to stop doing business with Paradyne.

Fred Farrar, a spokesman for the FAA, told *Computerworld* the FAA will not buy any more new equipment from Paradyne, but will purchase equipment that is currently leased from Paradyne in order to end the relationship.

Miriam K. Frazer, a Paradyne spokeswoman, said the FAA has not officially informed Paradyne of any forthcoming changes in the contract. She added that the firm says it is in the best interests of the FAA and taxpayers for the agency to continue doing business with Paradyne.

A GAO investigation concluded that although it was prudent to continue leasing installed Paradyne equipment to avoid disrupting the air traffic control system, the FAA should not buy more Paradyne equipment in light of the firm's suspension.

Farrar said, "We will not buy any more new equipment from Paradyne, even as options under existing contracts. We will, however, purchase equipment that we now lease from Paradyne, because that

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INDUSTRY INSIGHT
Clinton Wilder

Uneasy truce in chip war

What will benefit more from the recent U.S.-Japan semiconductor trade agreement — the profits of Intel Corp. or the U.S. Senate campaign of Silicon Valley Congressman Ed Zschau?

The question is purposefully cynical. But it stems from the stampede of politicians, from President Ronald Reagan on down, rushing to praise or take credit for the recent pact that purports to end Japanese vendors' alleged chip dumping in the U.S. It certainly makes for good politics, but the potential positive impact for beleaguered U.S. semiconductor vendors remains a huge question mark.

First, a look at the good side. A trade agreement, however superficial it may be, is certainly better than a trade war. If U.S. firms can have a little more confidence in the price stability of memory chips, they can plan future research and development and marketing strategies without the threat of the price slashing nightmare of the past two years.

Part of that confidence may come from the role that Japan's Ministry of International Trade and Industry (MITI) has pledged to play in enforcing the terms of the agreement. But that, too, is a question mark. If push comes to shove, and MITI is called on to research and document Japanese pact violations and enforce penalties, it will be

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Wilder is Computerworld's *senior editor, computer industry.*

Probst to retire; exec office formed for Sperry/Burroughs

By Alan Alper

NEW YORK — Burroughs Corp. last week went a step closer to taking over Sperry Corp. by establishing an executive office to manage the proposed $10 billion merged company.

In disclosing its new executive lineup, Burroughs revealed that Gerald G. Probst, Sperry's chairman and chief executive officer, would retire at the end of this year.

Probst, 62, is expected to take an unspecified consultant's role and will become a member of the new corporation's International Advisory Board.

The executive office will consist of W. Michael Blumenthal, Burroughs chairman and chief executive officer; Sperry President Joseph J. Kroger; Burroughs President Paul G. Stern; and Burroughs Executive Vice-President James A. Unruh.

Kroger will assume the new title of vice-chairman, handling external operations of the firm's commercial business, including all sales and marketing activities. Stern and Unruh will retain their previous titles, with Stern overseeing day-to-day operations and the firm's government business and Unruh managing corporate staff and planning operations, including finance.

Analysts were not surprised by Probst's intended departure or the makeup of the new corporate suite.

"Blumenthal honored his plan to give one Sperry executive a shot at the top job with a key position," noted Michael Geran, an analyst with E. F. Hutton & Co.

Jay Stevens, an analyst with Dean Witter Reynolds, Inc., said, "It's criti-

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DATA VIEW

Second-quarter earnings
[illegible]

Company	Net income April-June, 1986 (thousands of dollars)	Percent Change From 1985	Revenue April-June, 1986 (thousands of dollars)	Percent Change From 1985
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Boole & Babbage, Inc.[1]	244		8,705	+20
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Comshare, Inc.	130	−63	16,894	+1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Harris Corp.	16,919	+5	577,205	−5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Symbolics, Inc.	1,740	−2	31,717	+50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Trilogy Ltd.[5]	(10,865)		6,934	−14

[illegible]

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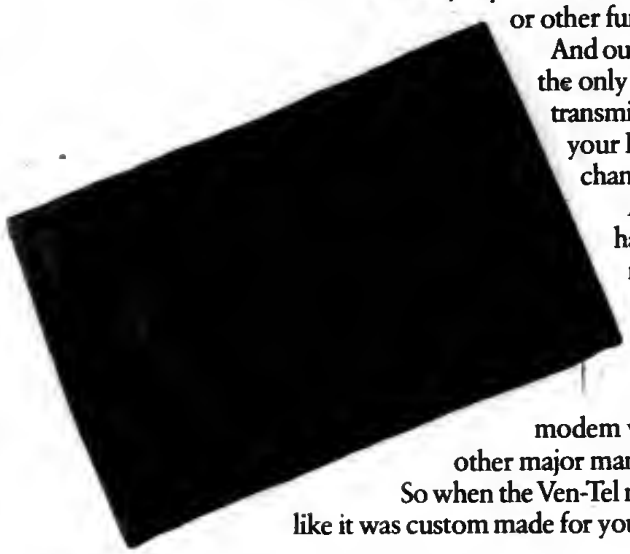

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